PART II.

AGRICULTURAL DESCRIPTIONS

OF THE

COUNTIES OF ALABAMA.

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The counties are here grouped under the heads of the several agricultural regions, previously described, to which each predominantly belongs, or, in some cases, under that to which it is popularly assigned. Each county is described as a whole. When its territory is covered in part by several adjacent soil-regions, its name will be found under each of the several regional heads in which it is concerned, with a reference to the one under which it is actually described. In the lists of counties placed at the head of each group the names of those described elsewhere are marked with an asterisk (*), and the reference to the head under which these are described will be found in its place, in the order of the list, in the text itself.

The regional groups of counties are placed in the same order as that in which the regional descriptions themselves are given.

The statements of areas, of woodland, prairie, etc., refer to the original state of things, irrespective of tilled or otherwise improved lands.

Appended to the description of each county from which a report or reports have been received is an abstract of the main points of such reports, so far as they refer to natural features, production, and communication. Those portions of the reports referring to agricultural and commercial practice are (in condensed form) placed in a separate division (Part III), following that of the county descriptions.

In making the abstracts of these reports it has been necessary, in most cases, to change somewhat the language of the reporter while preserving the sense. In some cases statements palpably incorrect or overdrawn have been altogether omitted, while sometimes explanatory words have been added, placed in parentheses.

METAMORPHIC REGION.

The following counties lie partly or wholly within the metamorphic region: Cleburne, Randolph, Chambers, Lee, Tallapoosa, Clay, Coosa, Talladega,* Chilton,* Elmore,* and Macon.*

CLEBURNE.

Population: 10,976.—White, 10,308; colored, 668.

Area: 540 square miles.—Woodland, all. Metamorphic, 400 square miles; Coosa valley, 140 square miles.

Tilled land: 51,428 acres.—Area planted in cotton, 9,156 acres; in corn, 21,552 acres; in oats, 5,672 acres; in wheat, 7,504 acres; in tobacco, 85 acres; in sweet potatoes, 221 acres.

Cotton production: 3,600 bales; average cotton product per acre, 0.39 bale, 555 pounds seed-cotton, or 185 pounds cotton lint.

The northern part of Cleburne county consists of high and rugged mountains of sandstone and subordinated ridges of flint or chert, alternating with valleys or inclosing coves of red or yellow fertile lands. This part of the county is of the same nature as adjoining portions of Cherokee and Calhoun. The red soils are based on the magnesian limestones of the country, and the broken and ridgy lands have a soil of gray or light colors. All these valley lands contain more or less of angular flinty gravel in both soil and subsoil. The timber on the flint ridges is in many cases prevalently long-leaf pine; upon the sandstone mountain the oaks and short-leaf pine predominate as a rule. The mountain lands are generally uncultivated; the ridge lands also, especially where

there is much of the chert or flint in large masses. Upon the slopes, however, there are often very good sorts of gravelly land with yellow subsoil under cultivation. The rest of the county is made up of slaty or crystalline rocks, and the soils derived from them are of two principal classes, viz: the red and the gray lands. In addition to these there are the sandy lands of the creek and river bottoms. In crossing the county from northwest to southeast one goes across the belts of different rocks and of the different classes of soils which are derived from them.

The western boundary of the county, as far north as township 14, is made by a mountain range of crystalline slates and conglomerate. In township 14 this range turns eastward, and its prolongation in Georgia is known as Dug-Down mountain. On this mountain, which is several miles wide, there is very little level land, and as the rocks which form the mountain furnish soils that are sandy and clayey and, in the main, not very fertile this part of the county is comparatively thinly settled and little cultivated. Across the mountain we descend into the valley of the Tallapoosa river, and of Cane creek, its western fork. The width of this valley varies, being at Ross' ford about one mile. The bottom lands are generally best suited to corn and other grain, though some are cultivated in cotton. The valley of the Tallapoosa is separated from that in which Arbacoochee is situated by a ridge some 200 or 250 feet in height, with little level land and few settlements. The valley of Arbacoochee is drained by a small stream called Dying creek, and in this valley many of the characteristic features of the valley lands of this region are well shown. The rocks which underlie these valley lands are comparatively easily disintegrated by the atmospheric agencies, and near the surface they have been weathered into reddish and yellowish clays, which retain the bedding or stratification of the original rocks. These rocks consist in part of thin beds or sheets of quartz, which resist decay, and as the more yielding materials are worn away the quartz fragments cover the ground. The soil is a dark-colored loam, underlaid with a red clay, which is the result of the removal and redeposition of the underlying slates, which, in turn, are the stratified clays resulting from the decay, in place, of the original rocks, as before stated. The valley lands are rolling and gently undulating, and comprise many very fair farms.

The region about Arbacoochee is best known as a great center of gold-mining operations thirty years ago. Southeast of Arbacoochee for 5 or 6 miles there are hilly or mountainous lands, with mica slates near the surface, thinly covered with soil, in consequence of which there is but little in cultivation. These harder slates alternate with others containing a good deal of hornblende (an iron-bearing mineral), and as the hornblendic rocks disintegrate quite readily, their positions are usually marked by valley-like depressions with a red or yellow clayey soil, which support a growth of white, red, and Spanish oaks, sour gum, walnut, and hickory. Pennyroyal, a lime-loving plant, is found in most of the fence corners where this soil predominates. The red soils of this kind are considered best for corn and other grains, but they are not so good for cotton. In good seasons they are quite productive, but are inclined to be droughty.

The lower part of this county is characterized by the predominance of red lands, a belt of which, 5 or 6 miles in width, crosses the county almost east and west near its southern boundary. The soil is a yellowish-brown loam, which for most crops is very productive. Throughout the county the gray soils greatly predominate, the red soils, with which they alternate, being usually in comparatively narrow belts. As showing the average composition of the red soils, see analysis of a soil of this kind from Lee county (page 16). The gray lands are of widely different grades of fertility, according to the nature of the rocks from which they have been derived. The best of the gray soils are derived from a granitic rock, and are frequently found closely associated with the red soils just spoken of. Such soils rank in fertility among the best in the county, but they are not the most widely distributed. Gray soils derived from mica and clay slates make up the greater part of the lands of this region, and are found both in the uplands and in the lowlands, being in the latter position usually somewhat more sandy. The gray lands have a growth of the various species of oaks, and where the sandy material predominates there is a growth of oak and pine. The average composition of the gray soil of the better quality may be seen from an analysis of a gray soil collected near Opelika, in Lee county (see page 16).

The cotton production of Cleburne county is small, which is partly due to the fact that there is no railroad or navigable stream. Lying, as it does, along the northwestern border of the metamorphic regions, only a small proportion of its soils can be rated as first class.

ABSTRACT OF THE REPORTS OF JOHN R. MOTIS, OF EDWARDSVILLE, AND OF JAMES H. BELL AND DAVID V. CRIDER, OF ARBACOOCHEE.

(These reports refer to the region drained by Crane creek and the main fork of the Tallapoosa river.)

In general, the uplands away from the streams are rather poor, and most of the farming lands are found in the vicinity of the river and the creeks. The low bottom lands are not best suited to cotton, as the plant is late in getting started and liable to injury from early frosts. For this reason the uplands, though not so fertile, are preferred. Notwithstanding these objections to the bottom lands, they are much cultivated in cotton, on account of the generally inferior quality of the uplands. The bottom growth is a mixture of oaks, hickory, walnut, gum, etc. The top soil is usually a sandy loam of gray and yellowish to dark colors, 8 to 10 inches in thickness, with a subsoil in general somewhat heavier, and of gray to yellow and reddish colors, according to locality. The underlying rock also varies with the locality, being, however, some kind of slate rock at depths of from 6 to 10 feet. These soils, while best suited to corn, are yet, in places, well adapted to cotton. The other soil varieties are the red lands, which are best for grain crops, and the pine lands, with gray gravelly soils.

The chief crops are cotton, corn, wheat, oats, etc., but the soil is for the most part best adapted to corn, cotton, and oats. From one-third to one-half of the cultivated land is in cotton, which usually grows to the height of 2½ to 4 feet. It is specially liable to run to weed in wet seasons, but can be prevented by topping. Fresh land yields from 800 to 1,000 pounds of seed-cotton per acre, and a 475-pound bale of lint requires from 1,425 to 1,545 pounds. The fresh-land staple generally rates as middling. After five years' culture (unmanured) the yield decreases about one-half. Crab-grass, purslane, etc., trouble the farmer. Very little land is turned out; and if reclaimed, it produces well for a few years. There is little or no damage from the washing of hillsides.

The cotton is hauled in wagons as fast as it is ready for the market (usually from November to January) to the nearest railroad station (Cedartown, in Georgia, or Oxford, in Alabama) and there sold to merchants. The rate of freight from Edwardsville to Cedartown is $1 50 per bale.

RANDOLPH.

Population: 16,575.—White, 13,155; colored, 3,420.
Area: 610 square miles.—Woodland, all. All metamorphic.
Tilled land: 81,426 acres.—Area planted in cotton, 23,177 acres; in corn, 29,595 acres; in oats, 4,850 acres; in wheat, 10,156 acres; in tobacco, 44 acres; in sweet potatoes, 433 acres.
Cotton production: 7,475 bales; average cotton product per acre, 0.32 bale, 456 pounds seed-cotton, or 152 pounds cotton lint.

In Randolph county, as in other counties of this region, the rocks and their derived soils are disposed in belts which have a general northeastern and southwestern direction, and in crossing the county from northwest to southeast the relations of these belts may best be made out. The hornblendic rocks, which yield reddish and tolerably fertile soils and give rise to gently undulating topography, occupy the northwestern corner of the county, and another belt of a very similar nature is found in the southeastern portion, while the greater part of the intervening country is made up of mica and clay slates. The mica slates extend as far as the Little Tallapoosa river, beyond which comes a belt of the clay slates to Wedowee, and then a repetition of the mica slates as far as the line passing northeastward through Louina. The country made by the mica slates is in general rather broken and the soils somewhat sandy, and is not very fertile. The timber consists of the upland oaks and hickories, with long-leaf pines, the latter becoming in many places the prevailing tree. The clay slates give generally a stiffer and more fertile soil than the beds just mentioned, and the usual timber is oak and hickory, with very little pine.

Below Wedowee, to the limit above named, while the mica slates are most prominent among the strata, they alternate with gneisses, which in many places take the characters of granites. The soils derived from this class of rocks are about the best in the county, and, as showing their average composition, the reader is referred to the analysis of gray granitic soil from Lee county, given on page 16. The mica-slate soils are well represented in the analysis of a soil of that kind collected in Clay county (see page 16). South of Louina to the line of Chambers county the soils are mostly red, derived from the hornblendic rocks alluded to before. The subsoils are also red, and rest on yellowish and reddish stratified clays, which are nothing more than the decayed slates of the country.

In the southeastern part of the county, from Roanoke to the line of Chambers, the soils are sandy, and deep beds of white sand remind one of the southern counties of the state. The color of this soil is gray to whitish, and the timber is chiefly long-leaf pine, with black-jack and the other oaks which are so commonly found in the piny woods. The only rocks which are to be seen in this pine region are sandstones and siliceous rocks, and in many places the fragments of quartz-seams cover the ground. This is usually the case, however, near the edge of the pine region.

The drainage of Randolph county falls into two systems, the greater part being into the Tallapoosa river, a small area in the southeastern corner belonging to the Chattahoochee.

In its relations to cotton production Randolph stands between Cleburne and Clay on the one hand and Chambers on the other. It is remote from a market, and its soils are not the best suited to cotton, except in certain sections, which are mostly in the lower part of the county.

ABSTRACT OF THE REPORT OF JAMES H. RADNEY, OF ROANOKE.

(The region referred to lies within the drainage area of High Pine and Corn House creeks, tributaries of the Tallapoosa.)

The uplands are preferred for cotton culture, since in the lowlands the plant is liable to be late, to take the rust, and to be killed by early frosts before full maturity. The two chief varieties of soil are those of the gray and red uplands, which make at least three-fourths of the cultivated lands of the region described. For cotton culture the slopes facing the south or southeast are preferred to other localities. The timber upon these uplands consists of pines, oaks, and hickories, the preponderance of one or the other of these trees depending on the quality of the soil. The top soil varies from light sandy and gravelly to a rather heavy, clayey loam of gray to brown or red colors, resting on a subsoil of yellow or red clay (sometimes very sandy). The underlying material is a soft, rotten-slate chalk, which is found at a depth of from 4 to 8 feet. Of less importance in the cultivation of cotton, but important for corn and other grain crops, are the light sandy-bottom soils. These have a natural growth of white oaks, beech, and poplar.

The chief crops are corn and cotton; the former on lowlands, the latter on uplands. About one-half of the land is planted in cotton, which usually attains a height of from 2 to 6 feet, but is most productive at 3 or 4 feet. Deep culture will cause cotton to run to weed. The usual yield per acre is from 800 to 1,000 pounds, *i. e.*, from two-thirds to five-sixths of a 400-pound bale, and varies but little for the first ten or twelve years of culture. Rag-weed and hog-weed are most troublesome. One-tenth of the land originally in cultivation is turned out, but when such land is treated with manure it produces well. The slopes are generally much damaged by washings, and the washings of uplands are frequently hurtful to the valleys. The damage has to some extent been prevented by hillside ditching.

Cotton is sent to market chiefly in December and January, most of it being hauled in wagons to West Point, in Georgia, the nearest railroad station (30 miles from Roanoke), the freight charge to that point being $2 50 per bale.

CHAMBERS.

Population: 23,440.—White, 11,364; colored, 12,076.
Area: 610 square miles.—Woodland, all. All metamorphic.
Tilled lands: 149,283 acres.—Area planted in cotton, 70,934 acres; in corn, 49,306 acres; in oats, 9,258 acres; in wheat, 11,520 acres; in tobacco, 39 acres; in sugar-cane, 211 acres; in sweet potatoes, 1,038 acres.
Cotton production: 19,476 bales; average cotton product per acre, 0.27 bale, 384 pounds seed-cotton, or 128 pounds cotton lint.

The water-shed between the Chattahoochee and the Tallapoosa runs nearly north and south through Chambers county. The bedded rocks which form the substratum of this county all have the general direction of northeast and southwest, except in the southeastern corner, where their arrangement is quite irregular; and on this account the soils of different kinds are in belts which pass through the county from northeast to southwest. The soils are

essentially of two kinds, the red and the gray, and a northeast and southwest line through the county a few miles northwest of La Fayette would be about the dividing line between these two varieties. Toward the northwest the soils would be mostly gray, and toward the southeast mostly red; but in both divisions the predominant soil variety is marked by many belts and patches of the other varieties.

In the northern and northwestern parts of Chambers county, where the gray soils prevail, the country is rolling or gently undulating, and the timber species is of upland oaks, with long-leaf pine, the latter becoming the principal tree in some localities where the soil is sandy. In the extreme northwest the underlying rocks are slates, which have been thoroughly disintegrated in place and have been converted into stratified clays of a yellowish color, with a top covering of yellow or brown loam, constituting the soil and subsoil. These slates are always interbedded with seams of quartz, the fragments of which in some places completely cover the ground. The soils are of moderate fertility. Near Milltown the granite appears often at the surface as large areas of bare rock. The granitic soils are among the best in the county, and their average composition may be seen by reference to an analysis under Lee county, given on page 16.

The red soils are characteristic over more than half of the lower part of Chambers county, and the hornblendic rocks from which they have been derived are usually worn down by denudation rather uniformly, producing an undulating surface. The timber is mostly oak, and nowhere can more luxuriant groves of red, Spanish, white, and post oaks be seen than upon the rolling red lands of Chambers. These red lands, as stated elsewhere, are better suited to the production of grain than of cotton, though a considerable proportion of the latter crop is always planted. The red lands have from the first been selected by the farmers, and it is rarely that any large areas can now be seen that have not been cleared and put in cultivation. Most of the handsome residences of the prosperous planters of *ante-bellum* days are situated in the midst of these lands, and are surrounded with the splendid oak groves alluded to.

Chambers county forms a part of the great central cotton belt of the state, and its soils, particularly those in the lower townships, are well suited to the production of cotton. Such are the red and gray gneissic soils, of which mention has been made before. From La Fayette to the southern limit of the county the greater part of the land is in cultivation, and cotton forms nearly one-half of the crops cultivated. The greater part of the cotton crop is sold to merchants at La Fayette, Opelika, and West Point.

LEE.

Population: 27,262.—White, 12,217; colored, 15,045.

Area: 610 square miles.—Woodland, all. All metamorphic; but the rocks over about 250 square miles in the southern part of the county are covered with stratified drift, which yields the soils and subsoils.

Tilled land: 122,875 acres.—Area planted in cotton, 51,889 acres; in corn, 30,137 acres; in oats, 11,918 acres; in wheat, 8,697 acres; in rice, 10 acres; in tobacco, 11 acres; in sugar-cane, 208 acres; in sweet potatoes, 925 acres.

Cotton production: 13,189 bales; average cotton product per acre, 0.25 bale, 357 pounds seed-cotton, or 119 pounds cotton lint.

Lee county, though formed by the strata of the metamorphic series, has these rocks almost entirely covered over the southern half by the beds of stratified drift. In the northern half of the county the metamorphic or crystalline rocks are directly concerned in the formation of the soils, and it is necessary to a proper understanding of the kinds and distribution of these soils first to give a short account of the rocks which yield them. The greater part of the county is made up of gneisses or crystalline sedimentary rocks composed of three minerals, quartz, feldspar, and mica, in varying proportions, by reason of which variations in the quality of the rock and of the soil derived from it are brought about. Further variations are due to the circumstance that hornblende may partly or wholly replace the mica. The hornblendic rocks, in decomposing, give rise to soils which are deeply colored red by iron. In many places the feldspar is deficient, sometimes wanting, and the rock passes into mica slate, with a corresponding change for the worse in the soil produced from it.

In the southern half of the county, or rather traversing it in a northeastern and southwestern direction near its center, is a belt of limestone (magnesian) associated with beds of micaceous sandstone. These, especially the limestone, are generally covered with beds of drift, and therefore very slightly affect the soils; the sandstone, however, forms some hills with sterile soil in the southwestern part of the county near the line of Macon. Aside from the drift soils, therefore, the arable lands of Lee county may be classed as gray, red, and sandy, the gray soils, derived from the gneissic rocks, being most abundant, forming about three-fourths of the land, and varying considerably in fertility, as might be inferred from what has been said before concerning the rocks which furnish them (see analysis of an average soil of this kind from near Opelika, page 16). The red soils are next in abundance as well as in importance in cotton cultivation, and an analysis of one of these, also from near Opelika, has been presented on page 16. The sandy soils are of least importance here as in other places. The drift soils vary, as usual, between heavy clayey loams and light sandy loams, and as they are similar to those soils elsewhere an enumeration and description of them need not be repeated here.

Lee county, like Chambers, is one of the great central cotton counties. The soils best suited to the cotton-plant are the red and gray gneissic soils in the north and the loam soils of the drift in the south, the latter characteristic of the gravelly hills region.

ABSTRACT OF THE REPORTS OF MR. JOHN T. HARRIS, OF OPELIKA, AND MR. C. H. M'CULLOH, OF BEULAH.

(These reports relate to the lands within the drainage areas of Osanippa and Hallawoka creeks and the Chattahoochee river.)

The soils, in the order of their relative abundance and importance in the cultivation of cotton, are the gray lands, the red lands, and the sandy lands. The gray soils constitute from a half to three-fourths of the arable lands of the county, the natural timber of which is short-leaf pine, all varieties of upland oaks, except the black-jack, which is comparatively scarce, hickory, and poplar; in swamps, ash, maple, and gum. This soil is a light sandy loam of prevailing gray color, passing occasionally into buff and yellowish. The average thickness to

change of color is from 3 to 6 inches. The subsoil is generally a little heavier than the surface soil, and is sometimes a yellowish or reddish clay, containing angular fragments of quartz. This subsoil is underlaid with the more or less decayed gneiss or mica slate from which it has been derived, and it is a not uncommon thing to see the subsoil passing by insensible gradations through the stratified clays into the unchanged rock. The red lands make up from a very small proportion to nearly one-half of the lands, but the red and the gray in some sections alternate with each other in such a way that it is impossible to map out their distinct areas except with a vast amount of close and accurate surveying. This soil is a light clayey loam, usually of brown, mahogany, and red colors, from 5 to 8 inches thick to a change of color. The subsoil in consistence is not much heavier than the soil, though perhaps commonly of a slightly darker red color. Like the gray soil, this also contains the angular quartz fragments. The red soils are considered best suited to corn and other grains, though cotton forms on this, as well as on the gray soil, two-thirds to three-fourths of the cultivated crop. The sandy soils in the neighborhood reported upon are of little extent, but are very generally planted in cotton.

The above-named lands are easy to cultivate in wet and dry seasons, being well drained, but rather early and warm. The crops are cotton, corn, wheat, oats, and sweet potatoes. The gray soil is perhaps best adapted to cotton and the red to corn and grain, but all the other crops generally succeed. From two-thirds to three-fourths of the whole area is planted in cotton, which varies in height from 2 to 4 feet, and is most productive when, say, 3 feet high. It runs to weed in wet weather in August, but this can be prevented by fertilizers and shallow culture. On fresh land the average production per acre is 600 pounds, or a half bale of 400 pounds of lint cotton. After 12 to 20 years' cultivation the loss in yield is at least one-third, and it then requires from 1,425 to 1,545 pounds of seed-cotton to make a 475-pound bale. Rag-weed and crab-grass are the greatest nuisances. From one-fourth to one-sixth of the land originally in cultivation is now turned out, but by the use of fertilizers such lands can be made to yield nearly or quite as much as when fresh. The slopes or hillsides are readily washed into gullies, and the valleys are injured by the washings of the uplands; but damage from these causes is being checked or prevented by horizontalizing and hillside ditching.

Shipments of cotton are made usually between August 15 and December 25. The crop is commonly sold to merchants in West Point, Georgia, and Opelika, Alabama, and by them shipped to market.

TALLAPOOSA.

Population: 23,401.—White, 16,108; colored, 7,293.

Area: 810 square miles.—Woodland, all. Metamorphic, all; but about 100 square miles in the lower part of the county are covered with stratified drift.

Tilled land: 143,175 acres.—Area planted in cotton, 41,200 acres; in corn, 41,415 acres; in oats, 9,106 acres; in wheat, 14,572 acres; in tobacco, 21 acres; in sugar-cane, 41 acres; in sweet potatoes, 408 acres.

Cotton production: 14,161 bales; average cotton product per acre, 0.34 bale, 486 pounds seed-cotton, or 162 pounds cotton lint.

There are no striking topographical features to be noticed in Tallapoosa county. The drainage is all into the Tallapoosa and the three principal tributaries on the east, Sandy, Blue, and Sougahatchee creeks, which have their sources near the water-shed between the Chattahoochee and the Tallapoosa, a ridge traversing Chambers and Lee counties. All the bedded rocks of the county are crystalline or metamorphic, and, like all strata of the region of crystalline rocks, lie in sheets whose outcropping edges have the prevailing direction of northeast and southwest. The soils derived from these rocks are disposed in parallel belts having the same general direction. Bearing these things in mind, a description of the agricultural features of the county may best be given by naming the soil belts which are crossed in succession in passing through the county from northwest to southeast.

As to color, there are two varieties of soils: the red and the gray; but the latter vary very greatly in respect to their fertility, as well as in respect to the rocks from which they have been derived, and in some cases, when derived from granitic rocks, rank among the best in the county. These have commonly a subsoil which is more or less reddish or yellowish in color. The characteristic timber consists of the species of upland oaks, with some short-leaf pine. When based upon siliceous rocks and mica slates, especially when these are very siliceous, the gray soils are sandy and have a light-colored sandy subsoil, and then the prevailing timber is the long-leaf pine, with its associates, black-jack and post oaks. Such soils stand low in the scale of fertility. Similarly, there are grades in the fertility of the red and yellow soils. Those derived from hornblendic rocks are of a deep-red color, are rich and strong, and are timbered with the upland oaks—white, red, Spanish, and post. Upon these the long-leaf pine is seldom seen. As has been before stated, the red soils are best suited to the grain crops. Another kind of reddish soil, derived from certain varieties of mica and clay slates, has a prevailing timber of small oaks, with very few pines. In addition to the above-named soil varieties there are the usual bottom soils, which are in their nature dependent upon the surrounding uplands, from which they have been washed; but as a rule the bottom soils are rather sandy, and in most cases are more fertile than the uplands.

As to distribution, in the northwestern corner of the county there is a small area in which the rocks are thick-bedded and approach granite in structure, and throughout this region the soils are red and gray, with red subsoils, and of rather exceptional fertility. Thence southeastward to Dadeville the country is made up of belts of light-gray sandy soils, timbered with long-leaf pines, alternating with light-yellowish sandy and loamy soils based on mica and clay slates, and supporting mostly oak growth. Subordinated to these are areas of red soils with red or yellow subsoils, but these do not become prominent till Dadeville is passed. Between Dudleyville and Dadeville there is much of this undulating country with oak and hickory growth, but a little northwest of the direct line between the two places runs a belt of long-leaf pine land with sandy soil, and in places, especially near the Tallapoosa river, in the vicinity of the line of Chambers county, there are deep beds of white sand, much resembling some parts of the state where the stratified drift forms the surface.

Below Dadeville, to the southeastern limit of the county, the red and gray soils, with red or yellow subsoils, prevail, with here and there a belt of sandy pine land. The red and the gray colors are about equally prevalent, and the soils about equal in fertility where both have the red subsoil. The agricultural characters of these two varieties are well shown in the abstract given on page 82.

South of the Sougahatchee creek to the lower end of the county the sands, pebbles, and loams of the stratified drift overlie all the country rocks, hiding them completely from view, except in the vicinity of streams. In this part of the county, therefore, these superficial beds are alone involved in the formation of the soils. In some parts

of the region thus covered with the drift there are beds of steatite, which will probably some day be of value. At Tallahassee the rocks cause cascades in the Tallapoosa river, and these have been utilized to furnish the power for one of the largest cotton factories in the state.

The chief cotton soils of Tallapoosa county are the red and gray gneissic soils and some of the lowlands of the river and creeks, and, in addition to these, the loams of the drift by which the southern portion of the county is covered. A large proportion of the cotton crop is produced in the southern sections, where there is a prevalence of the above-named soils. Toward the north and northwest the slaty soils are much less suited to the crop.

ABSTRACT OF THE REPORTS OF E. A. G. ROSS, OF CAMP HILL, DANIEL TAYLOR, OF NEW SITE, AND JAMES M. PEARSON, OF DADEVILLE.

(The second refers to the region drained by Emuckfau creek; the other two to the region of Sandy creek.)

About New Site the soils are mostly gray, with subsoils varying from a sandy clay to a rather stiff red clay. In the other localities the red and the gray soils are about equal in extent, the gray being, if anything, rather more abundant. The uplands are preferred for cotton, for the reason that in the lowlands the plant is likely to be late, and therefore to be killed by frost before maturity. Under all circumstances the use of ammoniated manures is recommended, as these cause the plant to mature early and escape the danger from frosts. The soils described are—

First. Gray soil. This soil makes from one-half to two-thirds of the cultivated lands of the county, and varies in fertility and in other respects with the varying quality of the subsoil, which is sometimes a red clay and sometimes sand or gravel. The timber in the first case is a mixture of oaks and hickories, poplar, ash, etc. When the subsoil is light, the long-leaf pine becomes a characteristic growth. The average thickness of the top soil is 6 inches. The underlying granitic rock, from which both soil and subsoil are derived, is found at varying depths from the surface.

Second. The red soils. These make from one-third to one-half of the cultivated lands of the county, being more widely spread over the southern half. The natural timber consists of oaks and hickories, with very few pines. The top soil is a fine sandy to clayey loam, 5 or 6 inches in thickness, with a subsoil of red clay, and is usually of a darker shade (brown) than the subsoil. The subsoil, as a rule, contains fragments of quartz or flint, the underlying original rock being found at varying depths. Of these two soil varieties the gray is best suited to cotton, the red to grain. On the light sandy gray soils the principal oak, which is associated with the pines, is the black-jack.

Third. Not more than one-sixth of the county is bottom land. The bottom soils are generally somewhat heavy, and are of colors and composition varying with the uplands from which they are derived. Their thickness is often great, from 1 to 5 feet. The subsoil is commonly of heavier texture, but lighter in color than the top soil, and is underlaid at varying depths by sand, gravel, and granitic and flinty rocks, according to locality.

Tillage is easy in light sandy and difficult in heavy red lands, and is easier for all lands in wet than in dry seasons. The chief crops are cotton, corn, oats, wheat, sorghum, sweet potatoes, etc., all being equally well adapted to the soil. The cultivated land is very nearly equally divided between cotton, corn, wheat, and oats. Cotton usually attains a height of from 3 to 3½ feet, and is most productive when nearly or quite at its full height. It is inclined to run to weed on fresh lands, especially with deep culture near the roots in wet seasons. Excess of weed can be prevented by shallow culture, by topping in July, and by the use of commercial fertilizers. Fresh land yields from 500 to 2,000 pounds of seed-cotton per acre, the average being, say, 800 pounds; a 475-pound bale requires 1,425 pounds of good and 1,583 pounds of average seed-cotton. The best fresh-land staple rates in the market as middling. The last picking after the bolls are frostbitten is light and inferior. After fifteen years in cultivation, lands originally thin will yield from 200 to 300 pounds of seed-cotton, but when originally rich the yield will be from 500 to 800 pounds. It requires from 1,425 to 1,545 pounds of seed-cotton from old land to make a 475-pound bale, and more seed-cotton from rich than from thin land to make a given quantity of lint. Crab-grass, rag-weed, hog-weed, and purslane are most troublesome. One-third of the old lands are not cultivated; but after several years of rest they produce nearly as well as when fresh. There is not much injury from washings except on coarse gravelly hillsides, which can be prevented by hillside ditching. Valleys are not hurt by the washings of the uplands unless clay is washed in to cover the soil. The damage from this source is usually prevented.

The cotton is sent off as fast as it is prepared for the market. Between September and March it is hauled on wagons to the nearest railroad station, usually to Opelika and Dadeville, and thence sent to different points north and east. The freight varies with the distance, the rate from Camp Hill to Opelika being $1 per bale.

CLAY.

Population: 12,938.—White, 11,870; colored, 1,068.

Area: 610 square miles.—Woodland, all. All metamorphic.

Tilled land: 57,972 acres.—Area planted in cotton, 13,921 acres; in corn, 24,503 acres; in oats, 4,834 acres; in wheat, 9,785 acres; in tobacco, 85 acres; in sugar-cane, 10 acres; in sweet potatoes, 237 acres.

Cotton production: 4,973 bales; average cotton product per acre, 0.36 bale, 513 pounds seed-cotton, or 171 pounds cotton lint.

One of the most prominent topographical features of Clay county is a high ridge (Blue mountain), composed of siliceous rocks, which runs northeast and southwest near its western boundary. With the single exception of Talladega creek, all the streams which have their sources in the hills of Clay county flow either southward or westward into the Coosa and Tallapoosa rivers. Talladega creek rises in the highlands east of this Blue Mountain ridge, and, flowing down the valley southwestward for 10 or 12 miles, turns northwest, and, cutting through the siliceous rocks of the mountains which form the western boundary of the county, flows out into the Coosa river across Talladega county. Approximately parallel with this ridge, and 6 or 8 miles distant from it toward the east, there is another ridge, which is formed chiefly of mica slates, with which, however, are associated ledges of quartz rock, which give rise to much rough and broken country. Between these two ridges there is a valley, which, with some interruptions, extends through the whole length of the county. In its upper portion, near the headwaters of Ketchapedrakee and Talladega creeks, this valley has the name of Fish-Head valley; in the lower part of the county it is called Horn's valley.

West of the Blue mountain (as the western ridge is sometimes called), out to the borders of Talladega county, the rocks of clay are all aluminous slates alternating with strata of quartzite, and the resulting soils are gray,

which are not very fertile. Where the siliceous rocks are most prominent, as upon the higher ridges, the soils are sandy, and support a growth of long-leaf pine; in other places the upland oaks are associated with the pines.

The soils of the valley lands above mentioned are of two kinds, red and gray, the former derived from the rocks which contain the mineral hornblende, and the latter from the mica and clay slates. These two varieties are in belts and patches, and it is impossible to give any detailed account of their relative distribution. The country from the eastern foot of the Blue mountain out to the vicinity of Ashland is in general rolling, though rising toward the east, and is made up of many alternations of mica and clay slates with the hornblendic rocks. Perhaps the most widely distributed soil is a brown loam resting on a yellow clay foundation and supporting a growth of red, black, and Spanish oaks, with a few chestnuts and hickories. A soil of this sort was collected near Mr. H. Watts', and the analysis of the same has been given on page 16. The soils of this class are good with favorable seasons, but suffer much from drought. Going eastward, the red color and stiffness of the soils increase, and at Candutchkee they have nearly the color and texture of some of the red valley soils of the adjoining county of Talladega. This red belt is next followed by a region made up of mica slates, which for great distances presents almost uniform characters. These latter rocks yield a brown soil with red-clay subsoil, and usually contains fragments of the much-decayed slate. The prevailing timber is post, red, and black-jack oaks, with some pines and hickories, the two latter, however, not very numerous. Soils of this kind may be seen from Delta to Hillabee, and probably in the continuation of the same direction to the lower limit of the county.

East of the ridge lands between Delta and Ashland, and a few miles below the latter place, there is a belt 4 or 5 miles wide of rather low, gently undulating country, called Flatwoods, covered with a mixed growth of oaks and pine, and having generally a gray and somewhat sandy soil. These flatwoods show a considerable variety as regards the fertility of the soils. Some are considered almost worthless, being too wet and too rocky for cultivation; but when good enough for cultivation the soil gives a fair yield, as all the cotton matures and there is no danger of its suffering from drought. Beyond the flatwoods, toward the southeastern corner of the county, there is first a belt 4 or 5 miles in width of granitic rocks, yielding a gray soil, which is usually quite fertile, and this belt is succeeded in the same direction by clay slates and micaceous and siliceous rocks, which give yellowish and gray clayey and sandy soils of no great value. In wet lowlands there is much of what is called "crawfishy" land, which is worthless unless improved; but by thorough ditching, turning under of green crops, and liberal applications of lime these make very good crops, and the crawfishy character disappears. They are also often much improved by simply allowing the washings from the red lands to settle over them.

Clay county has the disadvantage of being remote from market. The northwestern border of the county, being broken and mountainous, possesses comparatively few sections whose soils are well adapted to cotton production. The bulk of this crop in Clay is hence produced in the southern and eastern parts of the county. In the character of the soils cultivated in cotton Clay resembles Cleburne and Randolph on the one side and Tallapoosa and Coosa on the other, and the remarks there made apply also to the adjacent portions of this county.

ABSTRACT OF THE REPORT OF W. W. JENKINS, OF HILLABEE.

(This report refers to the drainage area of Enitochopka, Hillabee, and Hatchet creeks.)

The lowlands consist of first bottoms, which are generally sandy, and of gray, black, and yellowish colors; of second bottoms, which are more or less rolling, containing but little sand, and have gray, yellow, and red colors; and of flatwoods, a body of land 12 miles by 8 in extent, mostly with gray, sandy soil, interspersed with patches of black pine-swamp land, with yellowish soil. The flatwoods have a growth chiefly of long-leaf pine, with black-jack and other oaks, some hickory, sweet gum, walnut, poplar, and patches of crab-apple, persimmon, ash, maple, dogwood, alder, etc., on the branches, and occasionally a bush of cedar. The flatwoods are of average fertility, and are not droughty. The first bottoms are exceedingly productive; the second bottoms less productive, but surer of a crop than the first bottoms. The uplands consist of several varieties. The table-lands are very productive where hickory is found in abundance. Where the sides of the hills are heavily timbered with oaks, hickory, and poplar, with no undergrowth, there are many farms, even on steep hillsides, for the soil is always good. Many of the hills are covered with chestnut, chincapin, and sassafras, and are not much valued. A large proportion of the pine land is not considered worth cultivating, and many spots of good soil cannot be cultivated because of the great number and size of the rocks which cover the ground. In general, the summits and southern and eastern slopes of the hills are most heavily timbered and productive. The generally mountainous character of this county, with the early fall, late spring, and usually cool summers, makes the cotton season very short. The caterpillar comes late, and generally does more good than harm by exposing the bolls to the sun. Guano is much used to hasten the growth and maturity of the cotton-plant. The gray lands, which predominate, are the freest and warmest, and give best returns. The first bottoms are generally too cold, and the weed grows so rank that the plant rots and molds; they are also too much shaded by the hills. The second bottoms are generally rolling, with no hills so high as to shade them too much. The flatwoods, though the soil is only of moderate fertility, yield good crops, because they are warmer, more exposed to the sun, and are visited by frosts often some weeks later than the other lands. Wet winter and spring are considered most injurious to the cotton crop, as it takes the land in the flats and bottoms a long time to dry and become warm.

The most prominent characters of the principal soil varieties have thus been given. In the order of productiveness they would rank about as follows: the best uplands, whether red or gray, are indicated by a growth of numerous long hickory saplings; the black pine-swamp land, when properly drained, is very productive; while the yellow lands are the poorest of all. The uplands and flats are very easy of tillage, but the bottoms, being wet and rich, are likely to be overrun with grass, which is hard to manage.

The principal crop is cotton, which is cultivated on about one-half of the tilled land. The plant grows to the height of 4 or 5 feet, being most productive at 4 feet. The causes which incline the plant to run to weed are wet weather, too rich land, too much manure, and too much distance between the plants. Topping is suggested as the best remedy. From 400 to 700 pounds to the acre may be taken as the average yield of the fresh land, and about 1,485 pounds are needed to make a standard bale. The staple from fresh lands is usually better than that from land long in cultivation, since it is not so likely to be stained by the subsoil. After a number of years' cultivation (without manure) the yield is brought down to 300 pounds to the acre, with about the same proportion of lint to seed, but with somewhat inferior fiber, as it is shorter, less oily, and more brittle. The most troublesome weeds are the hog-weed, crab, and "hurrah" grasses.

One-fourth of the land formerly under cultivation is turned out. When again taken in, the yellow soils appear to be exhausted; but the black soils seem to be brought to life by a few years' growth of young pines, and if they have not been burned over and the straw been allowed to rot on the ground produce as well as ever. The uplands are all more or less easily washed, and the injury from this source is considerable. When ditching is resorted to, it is to save the uplands, since the lowlands are rather improved than injured by the washings from the uplands. Where the hillside ditches are properly cut they protect the uplands very effectually.

The shipping of cotton begins in September, and is made by railroad, principally to Savannah, Georgia, at the rate of $1 per bale.

COOSA.

Population: 15,113.—White, 10,050; colored, 5,063.
Area: 670 square miles.—Woodland, all. All metamorphic.
Tilled land: 80,791 acres.—Area planted in cotton, 26,468 acres; in corn, 29,990 acres; in oats, 5,325 acres; in wheat, 9,735 acres; in tobacco, 28 acres; in sweet potatoes, 412 acres.
Cotton production: 8,411 bales; average cotton product per acre, 0.32 bale, 456 pounds seed-cotton, or 152 pounds cotton lint.

The drainage of Coosa county is westward into the Coosa river, with the exception of a small strip along the eastern edge of the county, which is within the drainage area of the Tallapoosa. The water-shed between Paint creek and Weoguffka is a prominent ridge of siliceous rocks, which runs northeast parallel with the course of Paint creek, and very near it. This ridge divides into two nearly equal parts the northwestern quarter of the county, over which prevail soils of a light or gray color and sandy texture, with a timber growth in which the long-leaf pine is always conspicuous and, at times, the principal tree. The underlying rocks, however, from which these soils are derived differ on the two sides of this ridge. Northwestward to the limits of the county these rocks are siliceous and clay slates, with sandstones and a narrow belt of limestone in the extreme northwestern corner; southeastward, over a belt 6 miles in width, the prevailing strata are micaceous slates, usually much disintegrated, and often filled with garnets. In the direction of the river the country is much broken, and the hills bordering the streams are in some instances 400 or 500 feet above the water-level. Where the siliceous dividing ridge above noticed is cut by the Coosa river high cliffs overlook that stream, and near the southeastern limit of this belt, and between Weoguffka and Hatchet creeks, up to the Talladega county-line, steep, high ridges are numerous. Most of these hills are covered with long-leaf pine forests and are uncultivated, but hold apparently inexhaustible deposits of iron ore, which may some day be utilized.

Southeast of a line drawn from the mouth of Hatchet creek to the northeastern corner of the county alternating red and gray soils are distributed over a surface which is, in general, more undulating and less broken than that just described. The underlying rocks are also different, consisting chiefly of gneisses and granites, and the presence of the mineral hornblende in many of these imparts to the soils derived from them a red or brown color. The subsoils, even of the gray varieties of soil, are mostly of reddish colors, and are usually called red clays. Between Bradford and Rockford stretches a belt of granite, which in places may be seen as huge bowlders, resulting from the disintegration of the mass. The resulting soils vary from mulatto-colored to gray, and are of varying degrees of fertility. The timber upon the red soils is chiefly oaks and hickory, and that upon the gray soils the same, with the addition of pine. The short-leaf pine is in places associated with the other trees mentioned both on red and on gray soils, but the long-leaf pine seems to grow in force only upon the lighter-colored, sandier soils.

In the vicinity of the Coosa river, and near the lower line of the county, there is a tolerably wide terrace or river plain, some 150 or 200 feet above the water-level on an average, on which the underlying rocks are mostly hidden from view by the beds of sand and pebbles of stratified drift. In this region the drift alone is concerned in the formation of the soils and subsoils, since the country rocks are exposed only along the banks of the streams, and the aspect of the country is in nowise different from that which prevails over some of the southern counties of the state. In addition to the soil-varieties above mentioned, there are the usual bottom soils which take their character from the uplands from which they are washed. Over all that region where the soils are closely connected with the stratified rocks angular fragments of the quartz veins, with which these rocks are traversed, are commonly seen on the surface and in the subsoil; but as a general rule these quartz fragments are more numerous upon the gray than on the red lands.

The red and gray gneissic soils, and those of the lowlands of the various streams, especially of the Coosa river, form the best cotton lands of Coosa county. In the northwestern section the lands are much more broken and the soils less suited to cotton than is the case elsewhere. The superiority of Coosa to some of its neighboring counties in the matter of cotton production is doubtless due to its greater proportion of good river lands.

ABSTRACT OF THE REPORTS OF J. C. M'DIARMID, OF GOOD WATER, AND JUDGE J. S. BENTLEY, OF ROCKFORD.

(Both these reports refer to the lands drained by Hatchet creek, the former to the northeastern part of the county, the latter to the central portion.)

The lowlands and bottoms are in some parts not planted to any great extent in cotton, but in some cases, where they are not too wet, or are properly underdrained and fertilized, they are the best cotton lands, since the plant grows to perfection and matures and opens fully before frosts. In the bottom lands there is more depth of soil and more vegetable matter, and consequently the plant never fires or sheds, even in long droughts and when heavily fertilized. The two varieties of upland soils described are the red and the gray (the latter being the gray granitic soil, and not the sandy and siliceous soil prevailing in the northwestern part of the county).

First. The gray land makes about 60 per cent. of the area described. It is timbered chiefly with oaks, hickory, and pines, the latter mostly on the uplands. The top soil is a sandy to a clayey loam of gray and other light colors from 3 to 8 inches in thickness, with a subsoil of heavier texture and usually of a reddish or yellow color, containing angular fragments of quartz or flint. The subsoil is mostly quite pervious or leachy.

Second. The red soils make up the other 40 per cent. of the uplands, and have the usual oak and hickory growth. The top soil is a clayey loam of yellow, red, and brown colors, 6 or 8 inches in thickness on an average, resting on a subsoil of stiff, tenacious clay, which is of a yellow or mahogany color and rather impervious and difficult to break up at first, but which, on exposure, becomes brittle, and is then easily worked.

Tillage is easy on gray but rather difficult on red lands in dry seasons. The chief crops are cotton, corn, oats, wheat, sweet potatoes, and sorghum, the soil being best adapted to the production of the three crops first named. From one-third to two-fifths of the land is planted in cotton. Cotton is usually about 3 feet in height when grown, and is then most productive. It inclines to run to weed on fresh lands and alluvial soils, but this may be prevented by the use of commercial fertilizers. The yield of cotton per acre on fresh land is about 800 pounds, or two-thirds of a 400-pound bale. After fifteen years' cultivation (unmanured) the same land will yield from 200 to 500 pounds only per acre; but the same amount of seed-cotton (1,425 pounds) will be required for a 475-pound bale. Crab-

grass is the most troublesome of all grasses and weeds. Perhaps one-half of all the land at any time in cultivation now lies turned out; but the turned-out portion is being rapidly reclaimed, and when reclaimed is almost as productive as fresh land. In some cases the washings of the slopes or hillsides is very damaging; but the injury from this source is of no great extent, and consequently no measures have been taken to prevent it.

Cotton is shipped generally when a mortgage is foreclosed. The usual point is Opelika, and the rate of freight $1 per bale. Most farmers sell to merchants at the nearest railroad station.

TALLADEGA.

(See "Coosa valley region".)

CHILTON.

(See "Gravelly pine-hills region".)

ELMORE.

(See "Gravelly pine-hills region".)

MACON.

(See "Central prairie region".)

REGION OF COOSA VALLEY AND ITS OUTLIERS.

Comprising the whole or a part of the following counties: Cherokee, Cleburne,* Calhoun, Etowah, Saint Clair, Talladega, Shelby, Chilton,* Bibb,* Tuscaloosa,* Jefferson,* Blount,* Marshall,* Jackson,* and De Kalb.*

CHEROKEE.

Population: 19,108.—White, 16,418; colored, 2,690.

Area: 660 square miles.—Woodland, all. Coal Measures of Lookout mountain, 150 square miles; Coosa valley, etc., 510 square miles.

Tilled land: 88,819 acres.—Area planted in cotton, 24,388 acres; in corn, 33,373 acres; in oats, 7,477 acres; in wheat, 10,085 acres; in rye, 163 acres; in tobacco, 82 acres; in sweet potatoes, 335 acres.

Cotton production: 10,777 bales; average cotton product per acre, 0.44 bale, 627 pounds seed-cotton, or 209 pounds cotton lint.

The western boundary of Cherokee county runs along the top of Lookout mountain, in many places near its western crest. A belt of varying width along the northwestern edge of the county, but averaging perhaps 5 or 6 miles, is thus made of the sandstones and other strata of the Coal Measures. The soils derived from these are sandy loams of grayish to yellow colors, and the prevailing timber is a mixture of the upland oaks and short-leaf pine. For fruit cultivation these mountain summits have been found to be especially well-suited, as the crop is rarely injured by frosts.

Parallel with the southeastern edge of Lookout mountain, and at the average distance of about a mile from it toward the southeast, runs a red-ore ridge through the whole length of the county, and between this ridge and Lookout mountain lies a valley with a yellowish soil of very fair character, similar to that found in Dry valley. The red-ore ridge is of the usual character, sandy on one side and flinty on the other, and has steep slopes. Another similar ridge, called the Dirt-Seller mountain, runs parallel with this from the Georgia line to Round mountain, on the Coosa river, with one interruption, caused by the Chattooga river. The Dirt-Seller is in reality a V-shaped mountain, with the apex of the "V" just beyond the line in Georgia, one prong (the longer one) terminating at the Round mountain, and the other (the shorter one) terminating at Gaylesville. The country between these two prongs is known as Dry valley, and is a good farming area, the soils being brownish and yellowish loams. An analysis of a typical soil of this valley has been given in the general part. The country between the Dirt-Seller and the red-ore ridge at the foot of Lookout mountain is in general ridgy land with gray, flinty, gravelly soils. Across the Chattooga river, south from Gaylesville, and reaching into this state a few miles from the Georgia line, there is still another red-ore ridge, called Gaylor's mountain. All this part of the county, included in a triangle lying north of an east and west line through Round mountain and Cedar bluff, is mountainous and ridgy, with the ridges and valleys running northeast and southwest; but below that line nearly to the southern boundary of the county the country is comparatively level, a large proportion of it being what is known as Flatwoods, which form a belt 4 or 5 miles in width, occupied by the windings of the Coosa river, and is generally timbered with post oaks and short-leaf pines, with occasionally other oaks. The flatwoods soil is a cold, yellowish-gray material, sandy in places, and in places very tough and clayey. (See analysis of soil from Saint Clair county, page 20). Probably on account of the level character of the land and its bad drainage the flatwoods are not, as a rule, much in cultivation, though the analysis shows that they are by no means sterile soils.

Southeast of the flatwoods belt, to the mountainous region in the lower part of the county, the land is gently undulating, and the surface soil is sandy and mixed with rounded pebbles of quartz, precisely similar to the pebbles of the drift farther south. This sandy land has a characteristic growth of long-leaf pine with black-jack oaks, the genuine piny-woods timber, and the pine belt extends through the county into Etowah without material change. Both the piny-woods and the flatwoods belts are based upon siliceous and calcareous shales, and where the soil is

not too sandy on the one hand (from the overlying drift sands) or too clayey on the other (from the shaly portions of the country rock) it is sometimes very good cotton land. The cutting of pine timber gives occupation to a large number of the inhabitants of this belt, and "log-yards" are established at every convenient bluff along the river. Toward the southeastern edge of the piny woods, where the surface drift has not so completely covered the country rocks, there are many strips of long-leaf pine land, with soil derived from a siliceous sandstone, alternating with strips of loamy land derived from calcareous shales, having a growth of post oaks and short-leaf pines. This whole area—flatwoods, piny woods, and the mixed land just mentioned—is less generally under cultivation than the other parts of the county.

As we approach the southern and southeastern limits of the county the topography becomes much varied, and mountainous elevations, composed of sandstone and chert, rise up abruptly from the general level, making short ridges of 5 to 10 miles in length, and often over 1,000 feet in height above the surrounding country. These mountains are of two kinds, sandstone and flint or chert, those formed of the sandstone being the higher and the more important. They inclose coves of red fertile valley land, such as is described under Calhoun and Talladega counties, and alternate in the most irregular way with the flint ridges. The sandstone mountains are timbered usually with oaks and short-leaf pines, while the characteristic growth of the flint ridges is the long-leaf pine. Upon these flint ridges lie strewn immense masses of light-gray or whitish chert, and if the soils were much more fertile than they are in reality these flint fragments would offer serious obstacles to cultivation. In a similar way the sides of the sandstone mountains are covered with huge fragments of that rock. In the coves, and often upon the sides of these mountains and hills, lie the most valuable deposits of brown iron ore, which is worked up at numerous furnaces along the Selma, Rome, and Dalton railroad. This railroad in Cherokee county runs chiefly in coves between the sandstone mountains which occupy the southeast corner of the county.

Between this group of mountains and the Coosa valley proper, before described, there is a region of ridgy and valley lands, with good red- and brown-loam soils, based on limestones; and beyond these rises the Wisenar mountain, a ridge of sandstone, flanked on the eastern side with lower ridges of chert. The Wisenar is about 6 miles long, and its lower or southern end is nearly in the southwestern corner of the county.

The cultivated soils of Cherokee are in general terms to be classed as red and brown loams derived from limestones—gray, flinty gravel soils, which, as a rule, cover the ridges which traverse the valleys, and sandy soils near the river based upon the drift. To these might be added the sandy and flinty soils of the mountains, which are, however, not much in cultivation.

The relations of Cherokee county agriculturally are very well shown in the following abstract. The high product per acre shows that the better lands are selected for cotton.

ABSTRACT OF THE REPORT OF DR. JOHN LAWRENCE, OF CEDAR BLUFF.

The lowlands of the Coosa, Chattooga, and Little rivers, and Terrapin and other creeks, embrace a small proportion of black alluvial soil and close mulatto and coarse white sand in some localities. The uplands comprise the mountainous, hilly, rolling valley and table-lands near these rivers, with post-oak flats and pine woods, the soils being quite varied, embracing many qualities, and the flatwoods and long-leaf pine sections are almost valueless for cultivation. The river and creek bottom lands, together with the valley and table-lands, are the most productive.

Cotton culture in the region described has greatly improved within the last few years. Wet weather in the spring frequently retards planting, and drought in July and August causes shedding. We also have cut-worms and lice in the early stages of the plant, and caterpillars and rust later. The most important soils in the cultivation of cotton are:

First. The light mulatto-colored and gravelly lands of the valleys and of the table-lands near the river. These are sandy loams, timbered with oak, hickory, chestnut, short- and long-leaf pine. The lands near the river are rather lighter and more sandy, but more even and of smoother texture than the long-leaf pine soils. These are usually lightly timbered, and are easily cleared and cultivated, but very quickly exhausted; yet the subsoil in most cases is heavier, and when mixed with the surface soil is greatly improved, especially for cotton production. In both soil and subsoil the brighter the color the better the quality.

Second. The ridge lands having usually gray or light-colored soils, with yellowish subsoils, containing angular flinty gravel, and supporting the usual upland growth of oaks and hickories.

Third. The light-colored and mulatto sandy soils of Lookout mountain, with yellowish subsoil, and an upland growth of oaks, hickory, and short-leaf pine.

All the soils that are profitably cultivated have subsoils of dull yellow and red colors, usually of finer texture than the surface. In addition to the above there are some valley soils that are considered scarcely worth cultivation. These are (1) the long-leaf pine lands, which have a thin sandy soil and yellowish to nearly white clayey subsoil in the low grounds, but of darker colors on the elevated lands, frequently covered with rounded pebbles; (2) the flatwoods, which have a very thin soil, and a subsoil of white or light-gray crawfishy clay, containing in many places flat fragments of the shale from which it is derived. The soil and subsoil are often much alike, containing always more or less lime, and rotten lime-rocks may be found underneath in most localities. Both the pine lands and flatwoods are burned over every year, and hence there is no accumulation of vegetable matter.

All the cultivated lands are of easy tillage if properly prepared and with favorable seasons. They are rather cold and imperfectly drained as a class, and are well adapted to cotton, corn, wheat, oats, and pease. From one-third to two-fifths of the cultivated lands are in cotton, which attains a height of from 2½ to 6 feet, being most productive at 3½ feet. The plant inclines to run to weed with deep culture and good seasons, and, to prevent this, in its early growth it should have deep tillage, but afterward tillage should be quite shallow.

On fresh soils the seed-cotton product per acre, with proper cultivation, varies from 500 to 1,200 pounds, of which 1,425 pounds are required to make a 475-pound bale, the staple rating as low middling to middling when properly handled. After twenty years' cultivation without manure and without rest or rotation the yield would be light, say from 100 to 1,000 pounds, according to the original strength of the land. In these cases the proportion of lint would probably be less and the staple shorter. The most troublesome weed is crab-grass, but briers and other weeds are often bad.

Not more than 10 or 15 per cent. of the originally-cultivated land is turned out, and when this is again taken into cultivation it produces very well, especially if fertilizers are judiciously applied. The rolling lands are quite easily injured by washings, and the damage from this cause is often serious. But little, if any, injury is done to the valley lands from such washings. The only remedy as yet applied has been horizontalizing, and in the few instances where this has been properly done the results have been satisfactory.

Cotton is shipped, as fast as prepared for the market, by boat to Rome, Georgia, at about 75 cents per bale.

CLEBURNE.

(See "Metamorphic region".)

CALHOUN.

Population: 19,591.—White, 14,134; colored, 5,457.

Area: 640 square miles.—Woodland, all. Coosa valley, 610 square miles; Coosa coal-fields, 30 square miles.

Tilled land: 93,857 acres.—Area planted in cotton, 26,435 acres; in corn, 33,714 acres; in oats, 8,852 acres; in wheat, 10,745 acres; in rye, 287 acres; in tobacco, 29 acres; in sweet potatoes, 283 acres.

Cotton production: 10,848 bales; average cotton product per acre, 0.41 bale, 585 pounds seed-cotton, or 195 pounds cotton lint.

The western boundary of Calhoun county below Greensport is formed by the Coosa river; above that town by a red-ore ridge, which enters this county from Saint Clair. The eastern boundary is formed by a continuation of the same mountains which form the eastern limit of Talladega county. These mountains are the highest within the county limits, and the next most important heights are found in the sandstone mountains which traverse the county northeast and southwest, in general east of the Selma, Rome, and Dalton railroad, and at no great distance (6 to 8 miles) from the eastern boundary. One range of these mountains extends without serious break from near Cross Plains down to the vicinity of Oxford. At this place there is a gap, and the continuation of the range, under the name of Coldwater mountain, is found on the western side of the railroad. Besides this principal range there are several smaller peaks or spurs on each side of the main body of the mountain. The long range may be called the Jacksonville or Ladiga mountain, and plays an important part in determining the direction of some of the water-courses of the county, the tributaries of Terrapin and Choccolocco creeks having their sources east of this range in the valley between it and the mountain which forms the eastern boundary of the county. The latter stream flows southward down this valley to near the southern line of the county, and then turns westward through a gap and falls into the Coosa; the former, on the contrary, flows northward around the end of the mountain through a similar gap, and thence northwestward through Cherokee county into the river. The other streams of the county rise on the western side of the sandstone range. The valley drained by Choccolocco and Nance's creeks is based on the flinty magnesian limestone, and presents the usual fluted structure—flint ridges, alternating with fine valley lands with red soil. The red soils prevail in the lower levels, while gray gravelly soils characterize the uneven ridgy lands. West of the mountain range spoken of the country presents the same alternation of flint ridges and red valley lands out to a series of hills of sandstones and other rocks of the Coosa coal-field, which occupies a narrow belt of 4 or 5 miles' width near the northwestern boundary of the county. In this intermediate region between the two mountainous and hilly tracts just specified there is a large area of fine valley land with the usual red and brown soil, resting on red clay loam. The region about Alexandria is of this character, and some of the most desirable farms in the county are in this belt, which extends through its whole length.

The red level lands are, as usual, separated by flint ridges, and all the varieties between the deep-red and the light-gray gravelly soils are to be found. An analysis has been made of a red valley soil from near Jacksonville (see page 22). In the upper part of the county the flint ridges often broaden out, embracing large areas, which have the usual gray sandy, gravelly soil, changing to yellowish at 2 or 3 inches, and resting on a yellow clay at 3 feet depth. This soil supports a growth of long-leaf pine, with post and Spanish oaks and small hickories. In general, the flint ridges of this kind nearly always have a growth of long-leaf pine, and in the northeastern part of the county, where the sandstone mountains and the flint ridges are in close proximity to each other, the former have mostly oak timber, while the latter have the pine. In some instances, however, pine grows also upon the sandstone soils. At the northwestern border of the county the flint ridge which forms a part of the red-ore range is of different quality, being clothed with oak growth, without pine.

The low hills of the Coosa coal-field, while crossing the northwestern corner of the county, have little influence on the topography, as they have been much worn down, and the soils derived from them are, as usual, sandy and rather poor, in striking contrast to the rich red soils of the adjacent valley.

The valley lands of Calhoun are usually selected for cotton planting, as is the case in this section generally, and the high product per acre may be taken as indicating the superiority of the soil. The soils of the other counties included in the Coosa Valley region, viz, Etowah, Saint Clair, and Talladega, are of the same nature as those of Calhoun and Cherokee, and the relations of all these counties to the production of cotton are practically the same.

ABSTRACT OF THE REPORTS OF DR. S. C. WILLIAMS, OF OXFORD, AND T. W. FRANCIS, OF CANE CREEK.

(The first of these reports refers to the region about the Choccolocco (eastern valley), the second to that about Cane creek (western valley), and both relate to uplands as well as lowlands.)

In the lowlands the cotton is liable to rust, especially on old land, say from five to thirty years in cultivation. The lowlands are therefore better suited to wheat and oats, but good crops of cotton are made on them when fresh. For many reasons the uplands are preferred for cotton, especially if the soil is of fair quality, which is generally the case for 10 or 12 years, after which time it usually requires fertilizers. Late springs and early frosts tend to reduce the crop. The most important soil is a reddish or mulatto soil, which makes about two-thirds of the cultivated land in the valley. The natural timber on such land is red, black, white, post, turkey, and Spanish oaks, hickory, walnut, etc. The top soil is a gravelly, clayey loam of gray to brown and black colors, about 12 inches thick, with a yellow or red-clay subsoil, which becomes like the soil after cultivation. This mulatto soil grades into a gray soil in the hilly slopes, and the subsoil of both is a yellow clay, redder in the case of the mulatto soils. This subsoil always contains flinty or cherty gravel, and, in the red varieties, also pebbles of iron ore. The underlying rock is a limestone, which is reached at from 10 to 50 feet depth. From one-third to one-fifth of the land, according to locality, is bottom or made land, with a growth of beech, poplar, sweet gum, walnut, hickory, elm, ash, etc. The soil is a sandy or clayey loam from 1 to 5 feet in thickness, with a yellowish or bluish-white clayey subsoil, containing flinty pebbles, and resting on the limestone at varying depths. In the vicinity of Cane creek there is a soil variety

known as slate or post-oak land, which is timbered with post oak and black-jack, the top soil of which is a gravelly, in some cases putty-like, material, from 2 to 6 inches in thickness, and of a whitish color, and the subsoil a soft, black slate, which becomes hard on exposure to the air, and is then somewhat impervious. This land is not of much value, being almost worthless after a few years' cultivation. Upon the mountains there is a coarse, sandy soil of a whitish to gray color, 4 to 6 inches in thickness, with a subsoil which is like the surface soil, but has more flint intermixed with the white, sandy clay. All rest upon a flinty substratum. This soil supports a growth of long-leaf pine, mixed with black-jack and small trees, is the extreme of the flinty soils, and is found only on the ridges and mountain slopes. On account of its uneven and knobby character, it is liable to wash, and, being rather barren, is not much under cultivation.

Land is generally easily tilled in both wet and dry seasons. The chief productions are cotton, corn, wheat, oats, and rye, and the soil is well adapted to cotton and grain. At least one-half of the land is planted in cotton, which usually grows to a height of 3 feet. Deep culture and wet weather, one or both, cause cotton to run to weed, which can be obviated by shallow tillage and by "topping." Fresh land yields from 500 to 1,000 pounds of seed-cotton per acre, and it requires from 1,425 to 1,545 pounds of seed-cotton to make a 475-pound bale. Cotton from fresh land rates in market a shade higher than that from old land. The latter will not generally produce paying crops unless fertilized. All the best cotton land has been in cultivation from twenty to thirty years. Crab-grass and rag-weed make necessary early and late plowing. The soil does not wash much on slopes or hillsides, but the valleys are rather benefited than injured by the washings from the uplands. Whatever damage may result from rain on the slopes can be readily prevented by hillside ditching.

Shipments of cotton are made as fast as the cotton is baled. From Cane creek neighborhood the shipments are by boat to Rome, Georgia, at the rate of 75 cents a bale; from the other side of the county the cotton goes by railroad to Selma, Alabama, or to Rome, Georgia, the freight being the same to either place, viz, $2 50 per bale.

ETOWAH.

Population: 15,398.—White, 12,896; colored, 2,502.

Area: 520 square miles.—Woodland, all. In Coosa valley, 250 square miles; in Wills' valley, 90 square miles; in Murphree's valley, 40 square miles; Coal Measures, 140 square miles (40 on Lookout mountain and 100 on Sand mountain).

Tilled land: 60,780 acres.—Area planted in cotton, 15.187 acres; in corn, 24,891 acres; in oats, 5,025 acres; in wheat, 7,063 acres; in tobacco, 47 acres; in sugar-cane, 9 acres; in sweet potatoes, 230 acres.

Cotton production: 6,571 bales; average cotton product per acre, 0.43 bale, 612 pounds seed-cotton, or 204 pounds cotton lint.

Etowah county includes portions of two mountain plateaus and three valleys. All these natural divisions have a northeastern and southwestern direction through the county. The valley of the Coosa forms the eastern and southeastern parts of the county, and, like most of the valleys of the state which depend upon the geological structure for their existence, is a complex trough, made up of several smaller valleys, divided by ridges. The river with its windings occupies the central part of this valley, which is a gently undulating plain of 5 or 6 miles in width. This plain is based upon a shaly limestone which yields a clayey soil, usually badly drained, and not generally under cultivation where the limestone is near the surface. In the vicinity of the river, however, these limestones, together with their resulting soils, have been pretty generally covered with a deposit of loam, sand, and rounded pebbles, and these materials are more concerned in the formation of the soils than the underlying country rocks. Upon such soils the prevailing timber is long-leaf pine, which follows the river plain throughout the county and into Cherokee. The marginal belts on each side of the main valley are fluted with smaller valleys, separated by flint ridges, and present the usual variety of yellowish clayey and gray gravelly soils, the latter predominating upon the hilly portions and the former upon the more level areas.

Another belt of valley land stretches southwest below Gadsden to the county-line and beyond. In this area the sand and pebbles are mostly wanting, and the soils are dependent altogether upon the shaly rock. This whole region is quite level, and has a cold, yellowish, clayey, badly-drained soil, covered as a rule with its original timber growth, chiefly of post oaks and short-leaf pines, with red, Spanish, and black-jack oaks, and occasionally sweet and sour gums. This belt has the name of "the flatwoods", and is comparatively little cultivated, although the natural growth and the chemical analysis, as given on page 20, would indicate a soil of very fair quality. The trouble seems to be more due to defective drainage and other physical causes. On each side of this flatwoods belt are found the cultivated lands of the valley, which are, as usual, disposed in belts of mahogany land, alternating with the gray gravelly land of the ridges.

From the northeastern corner of the county to Gadsden stretches the lower extremity of the Lookout Mountain plateau, which is capped with the rocks of the Coal Measures, yielding sandy or slightly loamy soils and supporting a growth of upland oaks and short-leaf pine. From this plateau flows Black creek, making, where it leaves the mountain near Gadsden, a fine waterfall, which is one of the attractions of that vicinity. Parallel with Lookout mountain toward the northwest, and separated from it by Wills' valley, is the entirely similar plateau of Sand mountain. Beyond Sand mountain a part of the northwestern boundary of Etowah county is formed by Murphree's valley. These two valleys are in all essential respects similar to each other, and their structure is already described at length in the general part.

The valley soils are principally of two varieties, the red or yellowish and the gray soils, and as a rule the former occupy the subordinated valleys between the chert ridges, upon which the latter are most commonly found. Several analyses of each of these soil varieties have been given in the general description. The sandy soils are chiefly confined to the plateaus of Lookout and Sand mountains. The extreme southeastern boundary of the county is formed by a high cherty ridge, and a similar ridge runs nearly parallel with this and 5 or 6 miles west on the opposite side of the river, terminating at a bend in the river a few miles below Gadsden. Between these is the wide valley of the Coosa.

In its relations to cotton culture Etowah corresponds closely to Calhoun, which it adjoins, and the remarks there made will apply here also.

ABSTRACT OF THE REPORT OF W. B. BEESON, OF GREENWOOD.

(This report refers to the drainage area of Little Wills' creek.)

All classes of uplands produce reasonably well when properly cultivated. As this is near the northern limit of the cotton belt, it is best, in order to escape damage from frosts, to stimulate the plant to early maturity by the use of fertilizers. On bottom lands liable to overflow there is no cotton planted because of overflow and of early frosts. The soil varieties described are:

First. The dark mulatto or mahogany, which makes about one-half of the cultivated lands of the two Wills' valleys, and supports a growth of oaks, hickory, chestnut, and walnut. The top soil is a sandy loam of a brown to mahogany color, 6 to 12 inches in thickness, with a subsoil of heavier clayey texture, resting upon the limestone rocks at varying depths.

Second. The gray and dark gravelly lands, which divide the areas of the two valleys about equally with the preceding, and which support nearly the same natural growth. The top soil is lighter both in color and in texture than the preceding, and the same is true of the subsoil; but the subsoil is heavier and contains more clay, and also, as a rule, contains angular pebbles of flint.

Third. The sandy soils upon Sand and Lookout mountains, having the usual characters of the mountain soils. These sandy lands are easily cultivated. Clay is more crusty after rains, and waxy when not so wet. The uplands are rolling, and hence naturally well drained. The chief products are cotton, corn, wheat, oats, millet, sorghum, sweet potatoes, and clover. All kinds of land are fitted for corn and sorghum, and all kinds of uplands are suited to cotton. About one-third of the cultivated land is in cotton, which grows generally to a height of from 3 to 4½ feet, the highest being most productive unless the rains have been excessive. On lowlands, and especially in wet weather, cotton runs to weed; but it is generally thought that the yield is increased by topping the plant in July and August. The seed-cotton product per acre is from 600 to 1,000 pounds. Land does not seem to be injured by the first four or five years of cotton culture; indeed, cotton does not exhaust the soil as rapidly as many other crops. Crab-grass is the worst enemy, but is not feared when the crop is worked often and well. Very little land that was ever in cultivation is turned out. The soil washes on sandy or gravelly slopes, and on some hilly farms the damage is very considerable, but the valleys are improved by the washings from the uplands. There is some hillside ditching to protect the slopes, which is beneficial when well done.

The greater portion of the cotton crop is hauled to Gadsden, some to other towns on the railroad, between October 20 and January 1. Very little is shipped by the producer.

SAINT CLAIR.

Population: 14,462.—White, 11,621; colored, 2,841.

Area: 630 square miles.—Woodland, all. Coosa and Cahaba valley lands, 430 square miles; Coal Measures, 200 square miles (Coosa field, 150; Cahaba field, 50).

Tilled land: 65,105 acres.—Area planted in cotton, 14,735 acres; in corn, 25,465 acres; in oats, 4,603 acres; in wheat, 9,841 acres; in tobacco, 53 acres; in sweet potatoes, 226 acres.

Cotton production: 6,028 bales; average cotton product per acre, 0.41 bale, 585 pounds seed-cotton, or 195 pounds cotton lint.

The northwestern boundary of Saint Clair county is formed by Blount mountain, which is the southern end of one of the prongs of Sand mountain, already known as a part of the coal-fields of the state. In the northwestern corner of the county Chandler's mountain, about 6 miles long and 2 miles wide, is of the same formation. The Coosa coal-field, occupying a belt some 5 or 6 miles in width, runs nearly parallel with the Coosa river, which forms the southeastern boundary of the county, and at an average distance from it of 3 or 4 miles. In addition to these the northeastern extremity of the Cahaba coal-field runs up into Saint Clair county as far as the latitude of Springville. Between these mountainous or hilly lands, which the Coal Measures always form, lie the main valleys—Coosa valley, between the river and the Coosa coal-field, and Cahaba valley, between the Coosa and Cahaba coal-fields. These valleys are themselves complicated by ridges running their whole length, dividing them up into narrow ribbons or subordinated valleys differing widely from each other.

It will thus be seen that Saint Clair county presents a great variety in its topographical and other natural features. The topography, soils, timber, and other characters of the Coal Measures are about the same everywhere, the lands upon the smaller ridges being of two distinct sorts. The red-ore ridges run always parallel to the edge of the Coal Measures, usually less than a mile distant, and are formed of sandstones and cherty limestones, the sandstones being commonly found on one side of the ridge and the chert on the other. These ridges are often high and steep, and form a prominent feature of the landscape. Their characteristic soil is a red calcareous loam, which is specially suited to the production of small grain, but not of cotton, the slopes being usually too steep to permit cultivation to any great extent. Where the red-ore feature is not prominent the chert or flint, which also enters into the composition of the ridges, becomes the characteristic, and the slopes are covered with its sharp angular fragments, the soil thus formed, while very rocky, being quite fertile, as is shown by the luxuriant growth which covers it. In this respect the Red Mountain chert ridges are, as a rule, to be distinguished from the chert ridges, which are based upon a lower formation, the former being often called oak ridges, while pine is a characteristic growth of the latter.

Between the red-ore ridges and the Coal Measures there is always a small valley of yellowish or mahogany-colored soil of more than average fertility. This soil is similar to that of the red lands of the valley of the Tennessee, and its composition is shown in the analysis of Dry valley soil from Cherokee county (see page 24).

Next to the red-ore ridges (toward the center of the valley) the land is at first rather level and of good quality; then succeeds the cherty, gravelly lands, interspersed with flint ridges of Lower Silurian origin. These have a gray gravelly soil of medium fertility (see analysis of the soil collected near Ashville, page 22). The red or yellowish valley soil from the same locality is the type of the other class of valley soils. These yellowish soils, like the gray, are more or less mixed with angular flinty pebbles, but occasionally a cove of fertile red land may be found inclosed by ridges of the white angular cherty gravel, Clayton cove, just over the line in Jefferson county, below Springville, being an instance.

From Springville northeastward along the line of the Alabama Great Southern railroad there is a level country called the "flatwoods" with cold, yellowish soil, very little cultivated, and mostly covered with its original growth of post oak and pine, and in places with other oaks and gums. This soil is derived from a shaly limestone.

Saint Clair closely resembles the other counties of this section, and, as regards cotton culture here, the remarks under Calhoun county will apply equally well.

ABSTRACT OF THE REPORT OF JUDGE JOHN W. INZER, OF ASHVILLE.

(This report refers to the region of Big Canoe creek, a tributary of the Coosa river.)

Wet, cold springs and summer droughts, more than anything else, injure the cotton in this region. The soils described are three, viz:

First. Gray upland soil, often full of cherty gravel. This makes about three-fourths of the cotton land of the region, but not quite one-half of the valley lands. The usual timber consists of oaks, poplar, and short-leaf pine. Along the Coosa river the soil is sandier, and long-leaf pine prevails. These are the best cotton lands. The top soil is a fine sandy loam in the bottoms and a gravelly loam on the uplands; color, gray; thickness, about 3 inches. The subsoil is a reddish or buff clay, except in the bottoms where it is sandy. It contains angular pebbles of chert or flint, and is underlaid at 20 to 25 feet by a siliceous magnesian limestone.

Second. Red or mulatto upland soil. This makes a little over a half of the valley lands of the county, but not more than a fourth of it is planted in cotton, since it suits the grain crops much better. The timber is oak, hickory, poplar, etc. The top soil is a clayey loam of the colors above given, and has an average thickness of 4 inches; the subsoil is also a clayey loam, heavier than the top soil, containing angular cherty pebbles, and frequently, also, concretions of brown iron ore. This is underlaid with the same magnesian limestone that forms the basis of the preceding.

Third. The sandy bottom lands. These make only one-tenth of the cultivated area, and are found along the Coosa river and Canoe creek. In the former locality there is much long-leaf pine associated with the other growth. The chief growth of the bottom lands is white and red oaks, poplar, and hickory. The top soil is a fine sandy loam of a dark-gray color 5 inches in thickness; subsoil heavier, being mixed with some clay. It also contains angular cherty pebbles like the others, and rests on the magnesian limestone at from 6 to 8 feet.

Land is easily tilled in both wet and dry seasons, as it is early, warm, and well-drained. The crops are corn, cotton, oats, and some wheat, but corn and cotton are best suited to the soil. One-half of the cultivated land is planted in cotton, which, unfertilized, grows 3 and 3½ feet high, and is generally most productive just before attaining full height. Cotton is inclined to run to weed in wet weather in July and August, which can sometimes be prevented by topping. Fresh lands generally yield 800 pounds of seed-cotton per acre, *i. e.*, two-thirds of a 400-pound bale. The fresh-land cotton is quoted as middling. After 5 years' culture (unmanured) the yield is from 650 to 700 pounds per acre, and it then requires 1,485 pounds of seed-cotton to the 475-pound bale. Crab-grass is the arch enemy. Not much land is turned out; and when such land is taken into cultivation again it produces for two or three years very nearly or quite as much as when fresh. The slopes or hillsides are often much injured by rains. Valleys are also injured by the washings of the uplands, which injury is checked on some farms by hillside ditching.

Shipments of cotton are made mostly in November, by rail or by steamer on the Coosa river, to Nashville, Selma, Mobile, and New York. The rate of freight to Nashville is $3 per bale.

TALLADEGA.

Population: 23,360.—White, 10,856; colored, 12,504.

Area: 700 square miles.—Woodland, all. All Coosa valley and ridge land.

Tilled land: 113,389 acres.—Area planted in cotton, 32,841 acres; in corn, 40,376 acres; in oats, 9,278 acres; in wheat, 13,235 acres; in rye, 143 acres; in tobacco, 30 acres; in sweet potatoes, 335 acres.

Cotton production: 11,832 bales; average cotton product per acre, 0.36 bale, 513 pounds seed-cotton, or 171 pounds cotton lint.

Talladega county lies between a range of high hills on the east and the Coosa river on the west. The water-courses, with the exception of Talladega creek, have their sources on the western side of this range, which in part of its course is called Blue mountain, and flows westward into the Coosa. Talladega creek has its headwaters in the mountains beyond the borders of the county, cuts its way through the highest of these, and flows thence southwestward into the river. The three principal streams of the county are, beginning at the north, Choccolocco, Talladega, and Tallasseehatchee creeks, which with the smaller streams (Blue Eye, Clear, and Cedar creeks) receive all the drainage of the county.

The highest elevations in the county are found in the range which makes the eastern boundary, Blue and Rebecca mountains. Next in point of height are the mountains of sandstone of the Lower Silurian age, which occupy the central parts of the county. These mountains, like all made by this formation, consist of detached ranges, which, rising up abruptly from the plains, extend 15 or 20 miles, and then sink down quite as abruptly at the other end, beyond which, after an interval of 5 or 10 miles, another similar range makes its appearance. West of the Selma, Rome, and Dalton railroad, from Choccolocco creek to Alpine station, a distance of 15 miles or more, one of the most prominent of these ranges may be seen. At Alpine the height of one of the peaks is 2,000 feet above the railroad, or 2,495 feet above the sea-level. Northeast of the city of Talladega the peak called Mount Parnassus is a prominent landmark in that vicinity. Below Alpine, the continuation of this range is found on the other side of the railroad, and its direction is changed to south and east, and near its eastern extremity is known under the name of Pope mountain.

The lower part of the county is mostly occupied by a number of short ranges and peaks which have the collective name of the Kahatchee hills. Near Childersburg and Coosa bridge these mountains approach quite near to the river. A prominent peak in this vicinity is 800 feet in elevation above the river. All the mountains of this character are formed chiefly of sandstone, with some calcareous shales, which, however, never become prominent. The resulting soils are necessarily sandy and of no practical value. An oak growth covers the sides and summits of all these ranges, but cultivation is out of the question, even if the soils were fertile, on account of the huge masses of rock which form the surface. Upon the summits there is a scanty growth of gnarled and stunted trees, chiefly oaks.

Between these mountains and the eastern border of the county, and also between them and the river, are the valley lands, which are far, however, from being uniformly level. Based as they are chiefly upon flinty and magnesian limestones, these valley lands are traversed by flint ridges, which have a direction from northeast to southwest, and which, in the eastern part of the county, lie between narrow belts of valley land with fertile red and brown soils. These soils and their subsoils are usually filled with angular fragments of flint, and where this becomes a prominent ingredient the red color disappears, and the soil as well as subsoil becomes gray. The gray lands are commonly rather more broken than the others, lying frequently upon the sides of the flint ridges above spoken of. The valley lands east of the mountain ranges before described constitute the most attractive part of

Talladega county, and it would be difficult to find anywhere a section which has greater natural advantages than the belt of country lying east of the railroad as far south as the Kahatchee hills. The timber of this region consists of red, black, white, Spanish, and post oaks, hickory, and gums.

Where the soils are of deep-red color the subsoil is mostly full of pebbles of brown iron ore, which are sometimes present in quantities sufficient to constitute true ore banks. Where these masses of iron ore cover the surface (even sometimes to the extent of seriously interfering with cultivation) the soil is nevertheless highly fertile. The gray or ridgy lands have a characteristic growth of long-leaf pine, but other trees, especially oaks, are associated with it.

West of the sandstone mountains spoken of, and especially in the vicinity of the river, the chert or flint very much predominates. In this region, which embraces a belt 4 or 5 miles in width along the river from Choccolocco to Talladega creeks, is a succession of chert ridges, with gray, flinty, siliceous soil, timbered almost exclusively with long-leaf pine, interspersed with lime-sinks. The chert is sometimes accumulated in hills of considerable size, as in Calhoun mountain, near the mouth of Talladega creek, which is at least 350 feet above the river level. In some localities, as northwest of Plantersville, these pine woods are gently undulating, and the cherty fragments only occasionally show above the surface. This whole region, because of the sterility of the soils, is comparatively uninhabited except along the banks of the very few creeks which traverse it, but it has its value as a range for cattle. Inclosed by these barren flinty hills are occasional coves of excellent land with red calcareous soils. Howell's cove, west of Talladega, may be cited as an example. In the region of the Kahatchee hills there are many fine coves of red, fertile soil, hemmed in on three sides by the mountains.

Near the eastern border of the county, below the Kahatchee hills, the beautiful Talladega valley extends quite to the southern limit of the county. In this section is situated the well-known sulphur spring. Of all the watering-places in the state this has the most attractive surroundings.

The valley lands of Talladega are well suited to the culture of cotton, as is shown by the comparatively high product per acre. The low percentage of tilled land in cotton gives evidence that other crops are more profitable.

ABSTRACT OF THE REPORTS OF H. M. BURT, S. M. JEMISON, AND A. W. DUNCAN, ALL OF TALLADEGA.

(These reports are descriptive of the soil varieties occurring throughout the valley east of the railroad.)

The principal soil is the red valley soil, which makes nearly three-fourths of the cultivated land of the area described. This is timbered with red, post, and black-jack oaks, hickory, persimmon, and sassafras. The top soil varies from a light, fine sandy to a rather heavy clay loam of mahogany to brown and nearly black colors, and is from 1 to 12 inches thick. The subsoil is usually heavier, being mostly a tough red clay, containing angular fragments of flint and rounded pebbles of iron ore. It rests upon lime-rock, which is found at the average depth of 20 feet.

A gray gravelly soil makes about one-eighth of the area embraced by the reports, which is timbered with pine, mixed with other trees, such as oaks and hickory. The top soil is a sandy, gravelly loam, occasionally a clay loam, of a whitish to gray color, with an average thickness of 2 inches. The subsoil is usually heavier and yellowish in color, containing flinty gravel in quantity, and is underlaid first with sand, and below that with the lime-rock.

Still another eighth of the region is made up of the first- and second-bottom lands, which have a growth of beech, poplar, sycamore, iron-wood, sweet gum, etc. The soil is a sandy loam of gray to blackish colors, and some 12 inches in thickness; the subsoil a tough clay, hard at first, but becoming soft by cultivation. It also contains flinty, angular pebbles, and is underlaid with sand and the lime-rock at varying depths.

Land is usually easily tilled both in wet and dry seasons. The principal crops are cotton, corn, wheat, and oats, but the soil is best suited to corn and cotton. From one-third to one-half of the land is planted with the latter, which is generally from 2 to 4 feet high when grown, and yields best at or about the full height. Running to weed in wet seasons can be prevented by topping and by the use of acid phosphates. The yield per acre on fresh land is about 1,000 pounds, and from 1,485 to 1,545 pounds are required for a 475-pound bale. Fresh-land cotton rates in the market as first-class uplands. After ten years' culture there is a falling off of 25 per cent. in the yield, and it then requires from 1,545 to 1,660 pounds of seed-cotton for a 475-pound bale. Crab-grass and hog-weeds are the most troublesome of all the weeds. About one-fifth of the land is turned out, but such land brought into cultivation again will, with suitable fertilizers, produce good crops. In some places there is serious damage done to the hillsides by heavy rains, but the valleys are rather improved by the washings of the uplands. This damage has been checked to some extent by horizontalizing.

The farmers rarely ship their own cotton, but sell it, as fast as it is ready for the market, to the merchants in the little inland towns. These ship it chiefly to Selma, Rome, and Montgomery. The average freight rates are $2 35 per bale.

SHELBY.

Population: 17,236.—White, 12,253; colored, 4,983.

Area: 780 square miles.—Woodland, all. Valley lands, 385 square miles (Coosa and Cahaba); Coal Measures, 395 square miles (Coosa field, 235 square miles; Cahaba field, 160 square miles).

Tilled land: 58,550 acres.—Area planted in cotton, 17,919 acres; in corn, 26,159 acres; in oats, 4,764 acres; in wheat, 6,294 acres; in tobacco, 10 acres; in sweet potatoes, 346 acres.

Cotton production: 6,643 bales; average cotton product per acre, 0.37 bale, 528 pounds seed-cotton, or 176 pounds cotton lint.

The northwestern part of Shelby county is formed by the Coal Measures of the Cahaba field; the central belt by those of the Coosa field. Between the two is the Cahaba valley, and east of the Coosa field is the valley of the Coosa. The eastern edge of the Cahaba field as far south as Helena has a northeastern and southwestern direction, but below that it turns southward to Montevallo, and thence westward to the line of Bibb county. These Coal Measures have the usual rugged surface and sandy and not very fertile soils which are always found in such regions. The whole area is drained by the Cahaba river, which flows southwest the entire length of the county. Tributaries of the Little Cahaba drain the southern edge of this field in the vicinity of Montevallo. The direction of the main streams in this region has determined the topography. The principal ridges, with their dividing valleys, have a general northeastern and southwestern trend. The Cahaba valley, which is on an average 4 or 5 miles wide, has the usual features of the narrow valleys of central Alabama. It is fluted by a number of ridges with intervening

depressions running parallel with its length. A flint ridge, with gray, gravelly soil, and with oak and pine timber, commonly occupies the central portion of the valley, and red-ore ridges, with oak timber and red sandy loam and gravelly soils, lie near the two margins. On the eastern side the red-ore ridge is more or less prominent throughout the length of the county; but on the west it is often wanting altogether, in which respect this valley differs from those lying to the north and west. The subordinated valleys lying between these ridges are based on limestones, which are of varying degrees of purity, and hence the great variety in their soils as to composition and fertility. The two principal varieties are the yellowish loamy soil with red clayey subsoil and the gray soil with subsoil filled with angular fragments of flint. The analyses given on page 22 of soils from the valley near Ashville, in Saint Clair county, show the character of similar soils in this county. In the lower part of the valley, near Montevallo, there is a great development of deep-red soils, derived from the lower limestones of the valley formation. These are in composition and derivation similar to the red valley soils, of which an analysis has been given under Calhoun county (page 22). The flinty or cherty portions of the limestone near Montevallo lie often upon the surface in huge masses of most irregular shape, and where this chert prevails the soil is poor and long-leaf pine abundant. In the same region is another class of soils derived from gray, greenish, and chocolate-colored shales, of which, however, no chemical examination has yet been made.

The soils and other characters of the Coosa coal-field are, in the main, similar to those of the Cahaba field, but the center of the former field is occupied by a narrow belt of limestones yielding very good yellowish or mahogany soils, like those of Dry valley, in Cherokee county. This limestone belt is a peculiar feature of the Coosa field. The lands of the Coosa valley are, in general terms, like those above named. There is, however, a prevalence of gray cherty or flinty soils near the river which support a magnificent growth of long-leaf pine. South and southwest of Columbiana this pine growth reaches great proportions, and has furnished for many years the fuel of the Shelby furnaces.

In the southern part of the county, below the latitude of Helena, the underlying formations are in many places more or less hidden by the beds of sand, loam, and pebbles of a later period, and the surface soils are in such cases derived from these overlying beds. The best of these soils is a brown loam, which characterizes the oak upland region of all the lower part of the state, and has been mentioned in some detail in many places. About Columbiana the prevailing soil is a yellowish or buff-colored loam, which lies in good position, and is generally under cultivation. Northeast of that town is a small mountain, which incloses some coves of good farming land. The mountain itself is high, steep, and rocky.

While Shelby belongs to the agricultural division of the Coosa valley, it partakes also of the character of the gravelly hills; hence, while we find a larger percentage of the tilled lands in cotton, the product per acre is less. The soils of the latter division, though probably intrinsically poorer as a rule than those of the valley region, are yet perhaps better suited to cotton than to other crops; hence a larger proportion of the former.

ABSTRACT OF THE REPORT OF T. A. HUSTON, OF WILSONVILLE.

(This report refers to the drainage area of Yellow Leaf creek and the immediate valley of the Coosa river.)

The best cotton land is found on the easy rolling slopes in patches varying in size from 1 to 5 acres. In the flats the plant does not mature its entire crop in time to escape killing frosts unless highly stimulated with fertilizers; otherwise, the heavy gray lands with a yellow-clay subsoil would be our best cotton lands. (This kind of subsoil does not retain manures well.) The most important cotton soil is a sandy loam resting on a red-clay subsoil, which makes perhaps one tillable acre in every six. Its timber consists of oaks, hickory, pine, chestnut, and mulberry. The top soil is a coarse, sandy, and gravelly loam of a light color, about 4 inches in thickness, with a subsoil of red compact clay, stoutly resisting the plow, hardening when exposed to the sun, and an excellent retainer of all manures. It contains angular fragments of flint, and this material often lies at the surface as large rocks. At 8 to 40 feet depth is found the flinty limestone of the country. The other principal soil variety has been mentioned above. It is a heavy gray soil with yellowish-clay subsoil, but for reasons given it is not cultivated in cotton.

Lands are difficult to till in wet seasons. The chief crops are cotton, corn, wheat, oats, sorghum, and potatoes, but the soil is best adapted to corn and oats. About one-third of the land is planted in cotton, which usually grows to a height of 3 feet. Late planting or wet weather will cause excessive growth of weed, which can be prevented by shallow plowing. Fresh land produces 450 pounds per acre, and 1,425 pounds will make a 475-pound bale. After five years' cultivation, without manure, the yield per acre is 500 pounds with liberal culture and favorable seasons, and of this it requires only 1,425 pounds to the 475-pound bale. Generally the older the land (if well cultivated) the better the staple. Perhaps one-third of the land originally cultivated is now turned out; but such lands taken again into cultivation generally surpass the fresh lands. The soil on the hillsides is washed to a serious extent, and the valleys are sometimes rendered worthless by the washings of the uplands. The damage is checked to some extent by hillside ditching.

Cotton is shipped, as soon as ready for the market, by the railroad. Selma is the usual port, the freight to that point being $1 per bale.

CHILTON.

(See "Gravelly pine-hills region".)

BIBB.

(See "Gravelly pine-hills region".)

TUSCALOOSA.

(See "Gravelly pine-hills regions".)

JEFFERSON.

(See "Coal-Measures region".)

BLOUNT.

(See "Coal-Measures region".)

MARSHALL.

(See "Coal-Measures region".)

JACKSON.

(See "Tennessee valley region".)

DE KALB.

(See "Coal-Measures region".)

COAL-MEASURES REGION.

Comprising the whole or a part of Jackson,* De Kalb, Cherokee,* Calhoun,* Etowah,* Marshall, Madison,* Morgan,* Cullman, Blount, Saint Clair,* Shelby,* Jefferson, Walker, Winston, Lawrence,* Franklin,* Marion,* Lamar,* Fayette,* Tuscaloosa,* and Bibb* counties.

JACKSON.

(See "Tennessee valley region".)

DE KALB.

Population: 12,675.—White, 11,993; colored, 682.

Area: 740 square miles.—Woodland, all. Wills' valley, 250 square miles; Coal Measures, 490 square miles (on Lookout mountain, 100 square miles; on Sand mountain, 390 square miles).

Tilled land: 52,096 acres.—Area planted in cotton, 7,469 acres; in corn, 23,929 acres; in oats, 5,113 acres; in wheat, 6,846 acres; in rye, 383 acres; in tobacco, 19 acres; in sweet potatoes, 218 acres.

Cotton production: 2,859 bales; average cotton product per acre, 0.38 bale, 543 pounds seed-cotton, or 181 pounds cotton lint.

The greater part of De Kalb county is occupied by the plateau of Sand mountain, a high plain, whose surface rocks are the sandstones and conglomerates of the Coal Measures. The eastern boundary of the county runs northeast and southwest near the crest of the plateau of Lookout mountain, which is in all respects the counterpart of Sand mountain. The two are separated by Wills' valley, which extends through the county from northeast to southwest near its southeastern border. The highest points of the two mountains are along the edges of the valley which they inclose, and the slopes overlooking the valley are usually very steep, sometimes high cliffs, continuous for many miles, and almost insurmountable. Upon the mountain-tops the land slopes gently away from the rims next the valley. Little river and its tributaries drain the Lookout mountain plateau and Town creek that of Sand mountain. Upon the former, near Valley Head, are the beautiful falls of Little river, over 90 feet in height, with a deep rocky gorge below the falls.

The mountain soils are somewhat sandy, of a gray to yellowish color, and the timber consists of the usual upland oaks, with hickory, and, in places, short-leaf pine. Their cultivation is of comparatively recent date, the first settlers preferring the valley lands, which were originally more fertile. As the valley lands have become worn the mountains have been brought under cultivation, and there are now many considerable farms both upon Sand and Lookout mountains. Upon these plateaus fruit trees seem to thrive, and the crop is rarely killed or injured by frosts. Cotton also is here successfully cultivated with the aid of moderate quantities of fertilizers. The analysis of a soil collected on Sand mountain near Valley Head will show the chemical constitution of the average soil of these plateaus (see page 27).

The valley above spoken of is about 6 miles in width, and is in reality a complex trough, made up of four more or less well-defined smaller valleys, separated by three flinty or cherty ridges. At the foot of the mountains on both sides of the valley are narrow valleys, whose soils are yellowish loams of very good quality, resembling in character the soils of Dry valley, in Cherokee county, of which an analysis is presented on page 25. The other sides of these narrow valleys are bounded by red-ore chert ridges, in which have been found in several places beds of fire-clay of exceptionally good quality, and the working of these deposits gives employment to many. The center of the great valley is occupied by a more or less continuous ridge of chert, on each side of which are small valleys based upon the magnesian limestones.

Taken as a whole, the valley soils may be classed under three heads: the yellowish or mulatto loams of the valleys proper and sandy and cherty soils of the ridges. The character of the first has already been indicated.

The cherty soils vary considerably. The colors are gray to yellow, and the average composition would be near that of the barrens soils of northern Alabama. Where the slopes are not too steep and the surface not too much broken these soils are successfully cultivated. The small chert ridges which lie nearest to the foot of the mountains have, as a rule, on one side sandy and on the other flinty or cherty soils. These ridges are, however, usually so steep

that they are seldom much in cultivation, except near the foot. An analysis of soil from Red mountain, in Saint Clair county, has been given on page 24, which will show the general character of these soils. They are nowhere considered good cotton soils, being mostly devoted to wheat and other grain.

At Valley Head is the water-parting between the Tennessee and the Coosa drainages, the former by Lookout creek and its tributaries, the latter by Big and Little Wills' creeks. The latter flows near the foot of Lookout mountain, the former near the center of the main valley.

De Kalb county is occupied in great part by the two plateaus of Sand and Lookout mountains, upon neither of which is cotton cultivated to any great extent. Cotton culture is mostly confined to Wills' valley; hence the comparativly small percentage of tilled land in cotton, though the high product per acre attests the superiority of the soils selected for this crop. Cullman and Blount counties present similar conditions.

CHEROKEE.

(See "Coosa valley region".)

CALHOUN.

(See "Coosa valley region".)

ETOWAH.

(See "Coosa valley region".)

MARSHALL.

Population: 14,585.—White, 13,084; colored, 1,501.

Area: 560 square miles.—Woodland, all. Coal Measures, 375 square miles (253 square miles on Sand mountain; 140 square miles on the mountain spurs northwest of the valleys); valley of Tennessee, 185 square miles (40 square miles in Brown's and Gunter's valleys, south of the river; 50 square miles in Tennessee valley north of Guntersville; 95 square miles coves and slopes of the mountain spurs).

Tilled land: 68,175 acres.—Area planted in cotton, 16,412 acres; in corn, 27,113 acres; in oats, 3,471 acres; in wheat, 5,797 acres; in rye, 150 acres; in tobacco, 48 acres; in sugar-cane, 51 acres; in sweet potatoes, 243 acres.

Cotton production: 5,358 bales; average cotton product per acre, 0.33 bale, 471 pounds seed-cotton, or 157 pounds cotton lint.

Marshall county is divided about equally by a valley which traverses it from northeast to southwest. This valley is a trough cut down through the Coal Measures into the limestones and other rocks of underlying formations. The Tennessee river flows down it as far as Guntersville, at which point it turns northwest, cutting through the rim of the Coal Measures which bounds the valley on that side. Below Guntersville the valley extends through Marshall and Blount counties, under the name of Brown's valley. The valley is a complex one, being made up of at least three smaller valleys, separated by ridges of flint or chert, which are parallel to each other. These subordinated valleys have red or brown-loam soils based upon limestone, and are in general characters similar to the red soils of the great valley of the Tennessee.

The valley lands are level or slightly rolling, and have been generally cultivated. Big springs and lime-sinks are numerous and characteristic throughout the whole region. The dividing ridges above mentioned have mostly light-gray soils with reddish or yellowish subsoils, containing angular fragments of chert. The ridge lands are of varying degrees of fertility, supporting a timber growth which often indicates no mean soil, but the steepness of the slopes generally prevents their being brought into cultivation.

The valley rim on the eastern side is nearly continuous, but is indented here and there with gaps cut by the creeks which flow down from the elevated land on that side. This table-land or plateau of Raccoon mountain is an elevated, shallow trough, highest at its edges adjacent to this valley on the one side, and to Wills' valley, in De Kalb county, on the other side. The rim on the other side of the valley, below Guntersville, is similarly high and abrupt, but in the northwestern quarter of the county the rim has lost by erosion much of its original height, and its table-land character has in great measure disappeared. Upon all these highlands there is a capping of sandstones and conglomerates of the Coal Measures, and the resulting soils are of the kind described under De Kalb and Jackson counties, where the same formations are found.

Marshall county has a comparatively large proportion of valley lands suited to cotton culture. The sandy lands of the Coal Measures have not yet been extensively planted in this crop, although with fertilizers they yield well.

MADISON.

(See "Tennessee valley region".)

MORGAN.

(See "Tennessee valley region".)

CULLMAN.

Population: 6,355.—White, 6,312; colored, 43.

Area: 590 square miles.—Woodland, all. All Coal Measures.

Tilled land: 20,527 acres.—Area planted in cotton, 1,469 acres; in corn, 10,343 acres; in oats, 1,179 acres; in wheat, 2,569 acres; in rye, 480 acres; in sugar-cane, 66 acres; in tobacco, 41 acres; in sweet potatoes, 215 acres.

Cotton production: 378 bales; average cotton product per acre, 0.26 bale, 372 pounds seed-cotton, or 124 pounds cotton lint.

Cullman county is situated upon what has been termed the plateau, which is the southern prolongation of the Cumberland table-land. The southeastern boundary of the county is partly formed by Brown's valley, or rather by the high rim of the valley. This high level land extends thence north and northwest to the southern limit of the great valley of the Tennessee, in Morgan county. The table-land is drained partly into the Tennessee and partly into the Warrior river, the line separating the two systems of drainage being near the northern boundary of this county. The South and North Alabama railroad traverses the county, and the following altitudes will show the average elevation: Phelan, 692 feet; Cullman, 802; Milner, 840; Willhite's, 608 feet above tide. Blount Springs, which is in the valley on the one side, and Decatur on the other side of the county, have the altitudes of 434 and 577 feet, respectively. Geologically, this county is formed of the Coal Measures, and mostly of the lower strata of the same, for the limestones of the sub-Carboniferous formation are exposed above the drainage level in the valleys on each side of the table-land on which Cullman county is situated. The stratified drift, which plays so important a part both in the geological structure and in the soil formation of the counties west of Cullman, is here almost wanting. The soils of Cullman are derived almost exclusively from the disintegration of the strata of the Coal Measures, and vary according as these are sandstones and conglomerates or shales.

Cotton is a subordinate crop in all this region, yet experience has recently shown that these light sandy soils with good stiff subsoils respond well to fertilizers and yield very fair crops with a moderate outlay for manures. It is probable that a larger proportion of these lands is now planted in cotton than ever before.

ABSTRACT OF THE REPORT OF WILLIAM J. DUNN, OF CULLMAN.

(This report refers to the hilly, rolling, and table-lands lying along the headwaters of the Warrior river.)

This whole region is interspersed with many small streams, all tributary to the Warrior. These streams have very little first-bottom lands, and the whole area is much varied with spots of good and poor land. Warm weather, with occasional moderate rains, is much the best for growing crops, and for cotton culture the fair uplands are preferred to the low or wet lands. The most important soil is a light sandy loam, which makes about 90 per cent. of the county. Of much less importance are the dark sandy loams and the sandy bottoms. The growth upon the uplands consists of post and red oaks, short-leaf pine, chestnut oak, hickory, maple, dogwood, etc. The soil is usually a sandy or gravelly loam, sometimes a heavier clayey loam, of gray to brown colors, and averages 4 inches in thickness; the subsoil is rather heavier, being a reddish clay mixed with gravel, hard when dry, and underlaid with slate in some places and sandstone in others. Land is easily cultivated in wet and dry seasons alike, and rarely needs draining. The crops produced are cotton, corn, wheat, oats, rye, tobacco, sorghum, and millet. The soil is very well adapted to all these crops, and is specially good for growing grapes, peaches, and apples. Only about one-fifth of the land is planted in cotton, which usually grows not more than 3 feet high. Cotton generally runs to weed on lowlands in wet seasons. The seed-cotton product per acre is about 800 pounds, and 1,545 pounds are required for a 475-pound bale. After five years' cultivation, without fertilizers, the production does not amount to more than 500 pounds per acre. Crab-grass is more troublesome in wet seasons than all other weeds and grasses combined. A rest of two years to "turned out" lands is beneficial, but longer rest permits the land to grow up in bushes and sedge-grass.

Shipments of cotton are made from November to March, by railroad, to Montgomery, Nashville, and Louisville.

BLOUNT.

Population: 15,369.—White, 14,210; colored, 1,159.

Area: 700 square miles.—Woodland, all. Coal Measures, 460 square miles; valley lands, 240 square miles (Brown's valley, 170 square miles; Murphree's valley, 70 square miles).

Tilled land: 68,860 acres.—Area planted in cotton, 12,502 acres; in corn, 29,161 acres; in oats, 4,551 acres; in wheat, 10,087 acres; in tobacco, 48 acres; in sweet potatoes, 371 acres.

Cotton production: 4,442 bales; average cotton product per acre, 0.36 bale, 513 pounds seed-cotton, or 171 pounds cotton lint.

The central part of Blount county is formed by the high plateau of Raccoon mountain, which occupies a belt from 8 to 10 miles in width, running from northeast to southwest through the county. On the northwestern side of this plateau is Brown's valley; on the southeast, Murphree's valley. Raccoon mountain faces these valleys with a more or less continuous line of cliffs elevated several hundred feet above the general level, the height, as a rule, diminishing coming southward. The highest parts of the mountain lie along the edges of these valleys, the central part of its plateau being a pretty well defined basin, down which flows one of the main branches of the Black Warrior river. Near this stream the level is somewhat lower than that of the two valleys. The whole of this mountain basin has the sandstones and other beds of the Coal Measures for surface rocks, and the soils derived from them are the usual light-yellowish sandy loams, whose average composition is fairly shown by the analysis of a soil from De Kalb county (see page 27). The timber is composed of the species of upland oaks, with hickory and some short-leaf pine. These lands have lately been much esteemed as cotton lands, the use of moderate quantities of fertilizers insuring a good return, and in many places better and more profitable crops have been raised upon this land than upon the intrinsically more fertile valley lands. As pastures and for the cultivation of fruit, particularly of peaches and apples, this region is equal to any in the state. The fruit crop is rarely, if ever, cut off by frosts.

The valleys above mentioned are two deep troughs cut down by denudation into the lower rocks of the geological series. From the circumstance that these valleys have been worn down from the crest of a fold in the strata, the central parts of the same, while much lower than the mountain rims, are often higher than the country a short distance back from the rim. It thus often happens that the water rising in the valleys makes its way through these rims into the basin of Coal Measures, of which they are a part.

Brown's valley, on the northwest, is in reality for most of its length a double valley, Brown's being the western and Gunter's, or Big Spring Creek valley, the eastern. The two are separated by a flint or chert ridge, made up in great part by the siliceous fragments of the sub-Carboniferous limestones. The eastern, or Gunter's valley, has for its basis the limestones of this age, and the soils are the red and brown loams so prevalent in the great valley of the Tennessee. In the upper part of this valley, near the water-parting between the

Tennessee and the Warrior rivers, there is a great development of the sandy strata of the same formation (the rock which caps the Little mountains in Franklin and Lawrence counties), and the soils are gray or light-yellow sandy loams, timbered with oak, hickory, and short-leaf pine. In Brown's valley the calcareous rocks of a much lower geological formation appear at the surface, but the derived soils are yellowish clayey loam, not materially different from those of the other valley.

Between this valley and the rim of Coal Measures which forms a part of Sand mountain intervenes a ridge of the sandstone just spoken of, and at the western slope of this ridge, and at the foot of Sand mountain, there is a narrow valley of the same limestone, which underlies the eastern or Gunter's valley. The soil varieties, therefore, occurring in this complex valley are numerous, but are essentially of three kinds, viz: the red or brown calcareous loams of the valleys proper, resting on limestones; the flinty or cherty soils of the flint ridges before named, which are closely related to the soils of the barrens of the region north of the Tennessee river; and, lastly, the sandy soils prevailing on the water-parting previously mentioned. These do not differ materially from the soils of Sand and Raccoon mountains. In the lower part of the valley the flint ridges above mentioned reach a great height, as may be seen from the following list of elevations above tide: Blountsville, 807 feet; Wooten's peak, 1,200 feet; another peak (not named), 1,400 feet. Near the lower end of the valley are situated the well-known Blount springs, and to the northwest there is a narrow strip of Sand mountain belonging to this county, as the line follows the Warrior river.

Murphree's valley, on the eastern border of the county, is in many respects similar to that just described. In both the rocks of a geological formation much older than that of the Coal Measures appear at the surface and form the soils. Both are higher than the basins on each side, though the rims of these basins, which form the borders of the valleys, are several hundred feet higher than the valley lands. Murphree's is also a complex valley, being divided by ridges running parallel with its longest dimensions. These dividing ridges are mostly cherty or flinty, and the little valleys between have the reddish calcareous loamy soils which characterize the other valleys. Much of the gray flinty-ridge soils, especially where the lands lie well and are not too hilly, produce very fair crops, though they are not generally so much esteemed as the so-called red-clay soils.

The southeastern corner of Blount is occupied by a mountain plateau, similar to that making up the central belt of the county, and upon the eastern edge of this mountain runs the boundary-line toward Saint Clair.

Cotton culture in Blount county is chiefly confined to the valley lands; hence the small percentage of the tilled lands in this crop and the comparatively high product per acre.

ABSTRACT OF THE REPORT OF GEORGE D. SHELTON, OF BROOKSVILLE.

(This report refers to the lands drained by Big Springs creek, in the eastern or Gunter's valley.)

The soils described are, first, the loamy valley soil, which extends up and down the valley its whole length. Its timber is beech, walnut, poplar, sycamore, etc. The top soil is a sandy, gravelly, or clayey loam of gray, yellow, brown, and red colors, according to locality, thickness from 6 to 12 inches, and subsoil a thick loam, becoming under cultivation like the top soil. The subsoil usually contains angular flinty pebbles, and is underlaid at from 3 to 8 feet by limestone. This is the most important soil of this region. Subordinated to it are, second, the dark gray or mulatto lands, and third, the gravelly, sandy, and crawfishy lands, both based on sandstone rock. The dark-gray lands have a timber of post and Spanish oaks, hickory, pine, and black gum. Its subsoil is much of the same description. The gravelly sandy lands are timbered with short-leaf pine, maple, chestnut, and sweet gum. The color is whitish to gray; the thickness, 1 or 2 inches only; the subsoil is also light colored. This soil is better adapted to oats and rye, and is very little used in cotton planting.

Tillage is a little difficult in wet weather. The crops are cotton, corn, wheat, etc., but the soil is best adapted to corn and wheat. Only about one-fourth of the land is planted in cotton, which grows from 2 to 3 feet high, and runs to weed on fresh land in wet weather; but this can be prevented by topping at the proper time. The usual yield per acre is from 600 to 800 pounds, and it requires 1,160 pounds for a 475-pound bale. After five years' culture, without manure, the yield per acre will be from 500 to 600 pounds, and it requires 1,545 pounds of seed-cotton for a 475-pound bale. The staple from such land is better than that from fresh land. The principal nuisances are Spanish needles and crab-grass. No land is turned out. The soil does not generally wash or gully on the slopes or hillsides.

Shipments of cotton are made, mostly in December, by rail to Selma and Nashville, at the rate of $5 per bale.

SAINT CLAIR.

(See "Coosa valley region".)

SHELBY.

(See "Coosa valley region".)

JEFFERSON.

Population: 23,272.—White, 18,219; colored, 5,053.

Area: 960 square miles.—Woodland, all. Coal Measures, 760 square miles (Warrior field, 630 square miles; Cahaba field, 130 square miles); valley lands (Roup's and Jones' valleys), 200 square miles.

Tilled land: 71,959 acres.—Area planted in cotton, 14,220 acres; in corn, 30,928 acres; in oats, 4,708 acres; in wheat, 10,589 acres; in rye, 83 acres; in tobacco, 55 acres; in sweet potatoes, 504 acres.

Cotton production: 5,333 bales; average cotton product per acre, 0.38 bale, 543 pounds seed-cotton, or 181 pounds cotton lint.

Jefferson county is divided into two unequal parts by a long narrow valley which traverses it from northeast to southwest. Northwest of this valley, and forming nearly two-thirds of the area of the county, are the Coal Measures of the great Warrior field, and southeast the Coal Measures of the Cahaba field. In their natural features the Coal Measures are everywhere more or less alike, usually hilly and broken, and with soils, in the main, sandy

and of medium fertility, varying in quality with the underlying rock from which they are derived, which may be shale, sandstone, or conglomerate. The timber varies from that of fair oak uplands to piny woods. The scenery is usually much more varied than either the soils or the natural growth.

In striking contrast to these rugged hills is the valley, which is a deep trough and not a simple depression, but fluted with ridges and hollows, which run parallel with its length. The lower part of this trough goes by the name of Roup's, and the upper part is called Jones' valley. It varies in width from 4 to 10 or 12 miles, but where widest, in the northern part of the county, it is in reality doubled by the confluence of two valleys. The floor of this valley is higher than the general level of the country on each side, and all the creeks rising in it sooner or later break through its mountain rims and flow off into the rugged region beyond. Close to the rim of Coal Measures, on each side of the valley, there is a ridge containing red iron ore which rises to the proportions almost of a mountain, first on one side and then on the other of the valley, being rarely of equal height on opposite sides. Between these ridges and the rim intervenes a narrow valley with very fair soils.

Between the two red-ore ridges lies the main body of the valley, which is, in its entire length, divided by one (sometimes two) flint ridges, as they are called, made up mostly of angular fragments of chert, the remnants of the impure siliceous limestone which forms the basis of the valley. In places the flint ridge attains very considerable height, and is usually covered with a growth of post, black-jack, and other upland oaks. The hollows between the ridges are of various qualities—sometimes flat and glady, overgrown with cedars, and not in cultivation because of the proximity of the limestone to the surface; sometimes gently undulating, and covered with a yellow or mulatto soil, which produces well all the common crops. These latter are the typical valley lands. Along the slopes of the ridges, and occasionally making up nearly the entire valley, are somewhat broken lands with gray soil and buff subsoil, filled with angular fragments of flint or chert. These varieties all depend upon the varying quality of the siliceous magnesian limestone which usually underlies the central parts of the valley.

In addition to the above, there is in places a cold yellowish flatwoods soil, which, because of defective drainage and other physical properties, is seldom in cultivation. Between old Jonesboro' and the railroad station and southward the flint ridge becomes a very prominent feature, as it passes into a sandstone or conglomerate and widens out into a series of rugged hills several miles in width, timbered with long-leaf pine, and wholly uninhabited. These Salem hills extend from the Jonesboro' station southward about 6 miles. The two valleys, separated by the flint ridge, have often distinct names. 'Possum valley lies west of the ridge and Jones' valley east of the same. In several places the red-ore ridge is duplicated on one side of the valley, thus producing additional complications and a greater variety in the valley lands. McAshan mountain is the name given to one of these duplicated red ridges, which is 10 or 15 miles long on the western side of the valley between Jonesboro' and Tannehill. Northeast of Birmingham the valley widens out and eventually divides, one fork taking the name of Murphree's valley, the other continuing as Jones' valley, the former mostly in Blount county. The two are separated by a point of the Coal Measures called Blount mountain.

The red-ore ridge which follows the edge of Blount mountain southwest of the point of that mountain breaks up in a series of high knobs, which have the general name of Cedar mountains, from the circumstance that the limestone forming the great mass of the hills makes the surface and is covered with a dense growth of cedars. Occasionally, where the red ore and its accompanying sandstones form the summit of the hills, they have received the name of Button mountains, from the great abundance of the "buttons" or segments of the stems of crinoids with which they are filled. At this point of bifurcation of the valley the distance between the Cahaba coal-field on the east and the edge of Sand mountain on the west is some 10 or 15 miles. On the east, near the Cahaba field, is Jones' valley, and on the west, next to Sand mountain, the Back valley, as it is called. Between the two is the broken country before spoken of, formed by the Cedar and Button mountains, and also by the ridges of chert, which are invariably found in all these valleys. The rugged character of this part of the county is still further increased by the fact that the red-ore ridge itself is duplicated from Red Gap to the county-line, just below Springville. Between this duplicated red mountain and the similar ridges on the west, near the foot of Blount mountain, is Clayton's cove, embracing about 3 or 4 square miles, and hemmed in on all sides by red ore and flint ridges. The soil in this cove is the mulatto or red valley soil, with its accompanying gray flinty gravelly soil. It is all cleared and in cultivation, and quite thickly settled.

Between the base of Blount mountain and its red-ore ridge there is always a valley of greater or less width, according to locality, with yellowish or buff soil based on the sub-Carboniferous limestone. Its character is well shown in the analysis of the soil from Dry valley, in Cherokee county (see page 25). The slopes of the red ridges and the Cedar mountains, where not too steep and where the rocks are not too near the surface, are generally in cultivation. They are well suited to corn and wheat, but not to cotton. A soil of this kind from near Springville, in Saint Clair county, has been analyzed (see page 22).

Jefferson county has a large proportion of valley lands giving high product per acre, upon which alone in this section cotton is usually planted in any large quantity.

WALKER.

Population: 9,479.—White, 8,978; colored, 501.

Area: 880 square miles.—Woodland, all. All Coal Measures, but small areas, especially in the western part of the county, are covered with drift.

Tilled land: 46,725 acres.—Area planted in cotton, 8,743 acres; in corn, 21,838 acres; in oats, 2,579 acres; in wheat, 5,420 acres; in rye, 81 acres; in tobacco, 69 acres; in sugar-cane, 11 acres; in sweet potatoes, 325 acres.

Cotton production: 2,754 bales; average cotton product per acre, 0.31 bale, 441 pounds seed-cotton, or 147 pounds cotton lint.

In the northwestern corner of Walker county there is a high ridge capped with pebbles and sand. This ridge is a water-shed in its entire length in Winston, Walker, Fayette, and Tuscaloosa counties. From its position in Walker county, and from its general direction in other counties, it will be seen that the drainage of Walker county is toward the southeast. Near the dividing ridge spoken of the land is high and gently undulating, with a soil and

subsoil derived from the materials of the stratified drift formation, which forms the surface in that part of the county. Near the mouths of the streams which flow into the Warrior river, however, denudation has produced an extremely rugged country, with high, steep hills, and deep ravines between.

Near the southern extremity of the county the two forks of the Warrior river, known as the Locust and the Mulberry forks, come together, forming the main river. A part of Walker county lies between these two branches, as the line between Walker and Jefferson counties follows the water-parting. The elevation of this ridge above the river is not far from 275 feet. Close to the river in several places there are high ridges, capped with pebbles, with an elevation of 400 feet above the river level. This is, however, rather an exceptional height, as the general elevation of the country between the streams is not much over 200 or 250 feet.

In the northeastern part of the county, adjoining Blount and Winston counties, the scenery is rugged, on account of the proximity to the surface of thick beds of hard sandstone and conglomerate, into which the streams have cut their channels. The soils vary with the formations from which they are derived, those in the western corner, being mainly derived from the drift and loam, presenting the usual characters. Over the greater part of the county, however, they are derived directly from the sandstones and other rocks of the Coal Measures, and vary with the locality. As a rule, the soils of the Coal Measures are rather sandy and not very fertile; yet there are many areas of very good farming land, especially in the bottoms and lowlands of the various streams. In the vicinity of South Lowell, 6 miles north of Jasper, occupying perhaps a township, there is an isolated patch of long-leaf pine forest.

The abstracts of the reports under Winston and Cullman counties describe soils which are similar to those of Walker.

No railroad traverses Walker county, and the long distances to which it is generally necessary to haul the cotton crop in wagons is a bar to its successful production. The yield per acre is very fair, but cotton is planted only on about 20 per cent. of the land.

WINSTON.

Population: 4,253.—White, 4,236; colored, 17.

Area: 640 square miles.—All woodland. All Coal Measures, but in the western part of the county these rocks are covered with drift.

Tilled land: 17,767 acres.—Area planted in cotton, 2,048 acres; in corn, 8,098 acres; in oats, 579 acres; in wheat, 1,967 acres; in sweet potatoes, 172 acres.

Cotton production: 568 bales; average cotton product per acre, 0.28 bale, 399 pounds seed-cotton, or 133 pounds cotton lint.

The main dividing ridge between the waters of the Warrior and Tombigbee rivers runs almost north and south through the entire length of Winston county near its western line. This (the Byler) ridge, in the northwestern part of the county, also divides the waters of the Warrior from those of the Tennessee river, flowing through Big Bear creek. The greater part of the drainage of the county, therefore, is southeast into the Warrior river, the principal streams being Blackwater creek and the Sipsey fork of the Warrior river, with its tributaries, Clear creek, Brushy fork, and Rock creek. On the western side of the Byler ridge are the sources of the Buttahatchie and New rivers, which flow into the Tombigbee, and of Big Bear creek, a tributary of the Tennessee.

Although there are in this county no ridges except those formed by denudation, there is a gradual increase in the height of the land going northward from the Warrior river, through Walker and Winston, into the southern part of Lawrence county, where the southern boundary of the Tennessee valley and the northern boundary of the Warrior coal-field is formed by Sand mountain. The summit of this mountain, where it overlooks the valley of the Tennessee, has an average elevation above the general level of the latter of 475 or 500 feet.

The face of the country throughout Winston county is generally much broken. The map will show a great number of small streams which rise in the northern and western part of the county, and which, by their confluence, form the three or four principal streams mentioned above. The sandstones and conglomerates of the Coal Measures underlie, usually at no great depth below the surface, the whole county. These harder rocks are often underlaid with softer strata of shales, and the action of running water during the rainy seasons is to wear away the softer slates, thus undermining the sandstones, which break off in large masses, forming perpendicular cliffs. The undermining, thus described, causes the formation of overhanging ledges or "rock houses", which are to be found at the head and frequently along the sides of nearly all the ravines leading down toward the water-courses. These rock houses are the localities where the rarest and most beautiful ferns flourish. The creeks and other streams of Winston county have cut their channels down through these sandstones, and often flow through deep gorges with nearly perpendicular sides. In some instances rapids and waterfalls are produced, the Clear Creek falls being the best known of these. The waters of the creek here pour over two bluffs of conglomerate, each about 30 feet in height, the two being about 300 yards apart. Below the falls the creek flows down a deep, narrow gorge. These falls rival in beauty many which in other parts of the world are annually visited by thousands of tourists.

Over the Coal Measures, in the western part of the county, are tolerable thick beds of sand, pebbles, and loam of stratified drift age, which form the soils and subsoils. In the eastern parts, however, these beds decrease in thickness, and are almost entirely wanting east of the center, where the soils are in great degree derived from the disintegration of the rocks of the Coal Measures. The soils so derived are seldom very fertile, being usually rather sandy; the shales, however, yield loamy soils, which form sometimes very fair farming lands. The ridges between the water-courses in this region are not much in cultivation, both on account of the distance to springs of water and on account of the commonly rather thin soils, and the usual growth consists of post, red, and Spanish oaks, chestnut, sour gum, and in some places short-leaf pine.

The farming lands are mostly in the lowlands and in the creek bottoms, where the soil is of greater depth and more fertile. Where the stratified drift forms the surface, there is the usual variety of soils, frequently described in other parts of this report.

ABSTRACT OF THE REPORT OF F. C. BURDICK, OF HOUSTON.

(This report refers to the region drained by Yellow creek, a tributary of Sipsey fork.)

The uplands are preferred for cotton, as it is liable to be late in the lowlands. The three principal soils described are the brown-loam upland soil, the Yellow creek second-bottom brown-loam soil, and the light, sandy bottom soils of Brush and Clear creeks. The first makes about seven-eighths of the land of the region described, and has a natural growth of red, white, and black oaks, hickory, short-leaf pine, chestnut, and poplar. It is a fine, sandy loam of a brown color of an average thickness of 20 inches, with a subsoil of yellowish clay, hard when first exposed, but mixing readily with the surface soil. In cultivation it is almost impervious when undisturbed. This subsoil rests upon hard sand-rock at depths varying from 3 to 7 feet. The brown-loam lands of Yellow creek bottom make a tenth of the region reported upon. The natural timber growth is composed of oaks, poplar, beech, holly, and occasionally spruce pine. The soil is a fine, sandy loam of mixed brownish to black colors, with a thickness of 2 feet; the subsoil is heavier, a reddish clay, hard, not mixing readily with the surface soil, and is usually free from pebbles. It is also underlaid at 8 to 12 feet depth by hard sandstone. The light, sandy loams of Brush and Clear creeks have usually a brown color and a thickness of 15 inches. The subsoil is lighter, being usually a coarse sand, containing very few white pebbles.

The chief crops are corn and cotton, the latter being best adapted to the soil. About one-fourth of the land is planted in cotton, which usually reaches the height of 3 or 4 feet. Wet, warm weather causes excessive growth of the cotton plant, but this can generally be remedied by topping the plants. The average seed-cotton product per acre is about 500 pounds, and it takes 1,425 pounds to make a 475-pound bale. The cotton produced on this land rates in the market as middling upland. After five years' culture without fertilizers the yield per acre is not more than 300 pounds, and it requires 1,545 pounds of the cotton thus produced to make a 475-pound bale. The most troublesome weeds are crab-grass and rag-weed. Land is generally benefited by being turned out.

The cotton is sold mostly at the nearest railroad station, and is never shipped by the producers.

LAWRENCE.

(See "Tennessee valley region".)

FRANKLIN.

(See "Tennessee valley region".)

MARION.

(See "Oak and hickory uplands, with short-leaf pine".)

LAMAR.

(See "Oak and hickory uplands, with short-leaf pine".)

FAYETTE.

(See "Oak and hickory uplands, with short-leaf pine".)

TUSCALOOSA.

(See "Gravelly hills, with long-leaf pine".)

BIBB.

(See "Gravelly hills, with long-leaf pine".)

TENNESSEE VALLEY REGION.

Comprising the whole or a part of the following counties: Jackson, Marshall,* Morgan, Madison, Limestone, Lauderdale, Lawrence, Colbert, and Franklin.

JACKSON.

Population: 25,114.—White, 21,074; colored, 4,040.

Area: 990 square miles.—Woodland, all. Valley lands, 500 square miles (190 square miles in immediate valley of the Tennessee; 310 square miles, coves and slopes of the mountain spurs north of the river, half of which may be red valley lands); Coal Measures table lands, 490 square miles (200 on Raccoon mountain, south of the river, and 290 square miles on the mountain spurs north of the river).

Tilled land: 123,924 acres.—Area planted in cotton, 19,685 acres; in corn, 60,285 acres; in oats, 8,241 acres; in wheat, 10,051 acres; in rye, 347 acres; in tobacco, 99 acres; in sweet potatoes, 592 acres.

Cotton production: 6,235 bales; average cotton product per acre, 0.32 bale, 456 pounds seed-cotton, or 152 pounds cotton lint.

The surface of Jackson county is probably more broken than that of any other county in the Tennessee valley in northern Alabama. The valley down which the Tennessee river flows divides the county into two parts: Raccoon

mountain on the southeast, and the spurs of the Cumberland mountains on the northwest. It has an average width of about 4 miles, the greater part of this area being north of the river, leaving only a narrow strip on the other side. This valley is based on the rocks of the Lower Silurian formation, which consist of limestones, shaly, aluminous and flinty, or siliceous. The narrow bottom of the river is usually underlaid with the Trenton limestones, which also sometimes make low bluffs along the banks. The soils derived from these beds are calcareous loams of considerable fertility. Northwest of these lowlands a series of low ridges, 1 or 2 miles in width, run parallel with the course of the river through the whole county. These ridges are made by the flinty or siliceous limestones of the Lower Silurian formation, and are covered with a light-gray soil, usually filled with angular fragments of chert, and support a growth of short-leaf pines and occasional hickories. These soils resemble very much the soils of the barrens, though derived from entirely different rocks.

South of the Tennessee, Raccoon mountain faces the river with a line of cliffs almost continuous throughout the entire length of the valley, the narrow space between the river bottom and the foot of the mountain being occupied by a ridge of the cherty fragments of the lower sub-Carboniferous formation. Between this flint ridge and the foot of the mountain there is a narrow valley of very good reddish and yellowish soils, and where this valley is wide enough and the lands somewhat level these make excellent farming lands, as might be expected from the fact that they are derived from rocks the same as those which form the basis of the red lands of the great valley of the Tennessee. Along this line of cliffs the points are few at which the mountain can be ascended, and the roads lead up by gradual slopes or tortuous zigzags cut out along the mountain side. When the top is reached there is the usual plateau, very broad in this case, extending beyond the limits of the county. The monotony of this table-land is relieved by shallow ravines and depressions, along which run the creeks and spring branches. All the streams of this plateau are shed from the higher eastern edge, in De Kalb county, and flow diagonally across the plateau and off from the mountain on the Jackson county side. Where they leave the mountain they have usually cut deep, narrow gorges, which present, especially near their heads, wild and picturesque scenes. The height of the table-land is from 1,800 to 2,000 feet above the sea and from 800 to 1,000 feet above the adjacent valleys, and the timber consists principally of the various species of upland oaks, hickories, and short-leaf pines. The soils are light-gray and yellowish sandy loams, the general composition of which may be seen from the analysis of the Sand mountain soil from near Valley Head, in De Kalb county (see page 27). While intrinsically less fertile than many of the valley soils, these are far from sterile, and are now being very generally taken into cultivation by a class of small farmers. The table-lands have long been noted for the excellent pasturage which they afford.

The edge of the Tennessee valley on the north side is very irregular, and is deeply indented by coves of nearly level fertile land, which are underlaid by the rocks which form the basis of both the red and the barren lands (the latter, however, to a very limited extent) of the counties westward. Some parts are usually also indebted to the mountain limestone formation for their soils, and in this way there are many grades of fertility in lands of these coves. The ridges separating these coves, while decreasing in height toward the river, nevertheless terminate against the river valley in a series of heights with rather abrupt slopes, called the river hills, which are intermediate in level between the valley plain and the main body of the ridges. Near the river, where denudation has produced its greatest effects, those parts of the ridges which separate the coves have in many places been cut across by side ravines, and are thus more or less completely separated from the main body of the Cumberland table-lands. The river hills are mostly of this character.

Farther back, and generally north and northwest of the line of the Memphis and Charleston railroad, it is usual to find the summit of the highlands between the water-courses continuous with that of the great Cumberland plateau of Tennessee. The lower parts of these mountain spurs are usually made up of the calcareous strata of the mountain limestone, while sandstones and conglomerates form the upper parts and the summits. A line of sandstone cliffs near the summits makes the ascent of these spurs exceedingly difficult, and in the northern part of the county it is possible to cross the ridges only by making wide detours, following the courses of the streams, ascending the plateau near their headwaters, crossing the level areas on the top, and making the descent along a parallel water-course. Upon these spurs the soil and timber are the same as those of the summit of Raccoon mountain, described above.

To recapitulate, the soil-varieties of Jackson county are embraced under the following general heads:

1. The red, brown, and black soils of the hillsides, of the level and rolling lands, and of the river and creek bottoms. The soils of this class are derived from the mountain limestone, the lower sub-Carboniferous, and the Silurian formations. They form the great body of the fertile valley lands, are mostly in a state of cultivation, and hence from an agricultural standpoint are the most important. They also rank second as to superficial extent.

2. Light-gray siliceous or flinty gravelly soils, covering some of the creek bottoms and some of the slopes near the foot of the mountains, and also forming the flinty or cherty ridges which run parallel to the river on the northwest side. These are derived from the lower beds of the sub-Carboniferous and from part of the Lower Silurian formation. They are less important than any other described.

3. The light-yellowish or gray sandy soils which cover the mountain plateaus on both sides of the river, derived from the rocks of the Coal Measures, are in superficial extent the most widely distributed, and are gradually coming under cultivation.

Jackson county, like other counties of northern Alabama which have a substratum of limestones, is noted for the great number and boldness of the springs which break up from the fissures in the limestone.

Agriculturally, Jackson resembles Madison, which adjoins it on the west, though a much smaller proportion of its cultivated land is in cotton; but, on the other hand, a much larger proportion is in grain.

ABSTRACT OF THE REPORT OF W. F. HURT, OF BELLEFONT.

(This report refers to the lands drained by Mud creek, a tributary of the Tennessee river.)

On new lands the cotton grows too long and is liable to be cut off by frost, but it can safely be planted on beech and poplar lands when not too much exhausted by cultivation. The black lands are grass and grain lands, but are not suited to cotton. The most important soils are the red lands with red-clay foundations, the gray creek soils, and the barren, gray, gravelly or flinty lands which lie above overflow. Of these only the first is described in detail.

The red lands form about two-thirds of the cultivated area, and, alternating with the gray and black soils, are found throughout the county. The native growth is black and red oaks and hickory on the uplands; poplar, beech, walnut, sweet gum, and white oak on the lower lands. The top soil is a fine sandy or gravelly loam, alternating with a heavier clay loam of brown, mahogany, and red colors, the thickness being quite variable. The subsoil is heavier, and somewhat hard until acted on by rain and air. It generally contains angular, flinty pebbles, and is underlaid at 10 to 20 feet by hard limestone rock.

Lands are generally somewhat difficult to cultivate in wet weather. The chief crops are cotton, corn, wheat, etc., and the land seems equally well adapted to all. Perhaps as much as three-eighths of all the cultivated land is planted in cotton. The average height of fully-grown cotton is about 3 feet. Excessive rains will make cotton run to weed on rich lowlands, the usual remedy for which is topping. The seed-cotton product varies from 500 to 1,500 pounds per acre, and it requires from 1,425 to 1,660 pounds for a 475-pound bale. This cotton classes as middling. Ten years' culture without manuring reduces the yield from 500 to 800 pounds per acre. The most troublesome weeds are crab-grass, rag-weed, hog-weed, and lamb's-quarter. At this date no land lies turned out, as it is all needed for cultivation. The slopes are not much injured by washings, and the washings from the uplands are beneficial to the valleys.

Shipments of cotton are made, as fast as ready, to Memphis and Nashville, at the rate of about $2 25 per bale.

MARSHALL.

(See "Coal-Measures region".)

MORGAN.

Population: 16,428.—White, 11,758; colored, 4,670.

Area: 700 square miles.—Woodland, all. Coal Measures of Sand mountain, 275 square miles; sandy lands of the Little mountains, 140 square miles; valley lands, 285 square miles (red lands, 100 square miles; coves and slopes, 185 square miles).

Tilled land: 95,584 acres.—Area planted in cotton, 18,828 acres; in corn, 35,610 square miles; in oats, 4,704 acres; in wheat, 7,005 acres; in rye, 135 acres; in tobacco, 52 acres; in sweet potatoes, 365 acres.

Cotton production: 6,133 bales; average cotton product per acre, 0.33 bale, 471 pounds seed-cotton, or 157 pounds cotton lint.

In going from the Tennessee river southward through Morgan county one would come upon four terrace-like plains, each with a rather abrupt slope toward the north and a gentle incline southward. These plains would be:

1. The river bottom, with its loose, rich, alluvial soil liable to overflow, and for this reason mostly planted in corn, though some parts are put in cotton.

2. The valley of the Tennessee, which is from 75 to 100 feet above the river level, and which is a nearly level plain with rich red or brown soils, interspersed here and there with small rocky knolls, crowned with dense groves of post oak, black-jack, and hickory. The greater part of this valley, which has the same general characters here as in Lawrence county on the west, is cleared and under cultivation, and the original timber is represented only by these remnants left on the rocky ground. The width of the valley varies greatly in different parts of the county. Thus, for instance, opposite Whitesburg, in the eastern part, it is only a mile or two from the river to the foot of the Little mountains on the south side of the valley, and down to the mouth of Flint creek the mountain in many places forms bluffs along the river bank, while near Decatur it is 6 or 8 miles wide, and in places still wider. It will not be necessary to repeat the descriptions already given of other parts of this valley in Lawrence and Colbert counties.

3. From the valley there is an abrupt ascent of 75 to 200 feet, according to location, to the summit of Little mountain, which is capped with a stratum of sandstone belonging to the upper part of the sub-Carboniferous formation. This sandstone has been mentioned somewhat at length under Lawrence and Colbert counties, where it occupies a similar position upon Little mountains. This mountain, in its entire length, owes its existence to the protection against denudation afforded by the bed of sandstone. The soils derived from this rock are sandy and not particularly fertile, as may be seen from the analysis of the soil from near La Grange, given on page 34. Occasionally, where the sandstone has been cut through by erosion, the limestone which lies below it comes to the surface, forming very limy, prairie-like soils, which are very little under cultivation on account of their droughty nature, due to the proximity of the limestone to the surface and the consequent thinness of the soil. These areas, however, make excellent pastures. A large body of this kind of land has been mentioned under Lawrence county.

4. From the summit of the Little mountains, and overlooking the Tennessee valley, there is a gradual descent, going southward, to the foot of Sand mountain, which makes the fourth terrace above spoken of. The distance across from the summit of the Little mountains to the foot of Sand mountain varies very greatly. Opposite Whitesburg these Little mountains are a mere bench on the side of Sand mountain from one-half to one mile in width, but it widens toward the west, and in the vicinity of Decatur the distance is 10 or 12 miles from the summit back to Sand mountain. The gentle slope going southward is due partly to the dip of the rocks themselves in that direction, but much more is due to erosion, since the slope is greater than the dip of the strata. In the southern part of the valley thus formed between the two mountains, and beyond the sandy slope of the Little mountains, the drainage has cut down into the calcareous rocks which underlie the sandstone of the Little mountains, and the soils produced from the disintegration of these rocks vary considerably in character, some being black, prairie-like soils, similar to that of the prairie of Lawrence county, already mentioned, and some gray and crawfishy, and not much prized. From a few miles south of Decatur, up the valley of Flint creek, there is a good deal of this level, sticky, gray land, which appears to be derived from some of the deeper-lying, shaly, calcareous strata. Along the bases of the northern slopes of the spurs of Sand mountain there is a mulatto soil of very considerable fertility.

From this description it will be seen that the valley between the two mountains, which in Lawrence county has fertile red and brown soils similar to those of the Tennessee valley, in Morgan county, is more or less sandy, except where the streams have cut their channels down into calcareous rocks. It is doubtful whether in Morgan county the streams have anywhere (except in the vicinity of the river) cut down into the strata which form the basis of the red soils of the Tennessee and Moulton valleys, and this for two reasons: Erosion has been probably less

effective eastward than westward, and the thickness of the upper sub-Carboniferous beds which overlie the strata in question is very much greater in the eastern than in the western part of the Tennessee valley. Even in the eastern part of Lawrence county the red soils begin to be replaced by the gray and limy soils previously mentioned.

The fourth terrace, as has already been stated, is formed by Sand mountain, which is a part of the great coal-field, and capped by the sandstones and other rocks of the Coal Measures, and has always an abrupt slope, and in places a cliff-like slope northward toward the valley, but is nearly level on the top. The height of this summit above the adjacent valley is from 200 to 450 or 500 feet, according to locality, the greatest height being toward the east. In Lawrence and Franklin counties the northern edge of Sand mountain is comparatively little indented, and forms the water-shed between the Warrior and the Tennessee drainages, except in the case of Big Bear creek. This is the case also in Morgan county as far as the valley of Flint creek. Eastward of that point, however, this rim is deeply indented, and its outline against the valley is formed of mountain spurs, separated by deep coves, cut far back into the mountain by the streams. These spurs, like Sand mountain, of which they are a part, are in great measure composed of the calcareous strata of the mountain limestone, which is the upper group of the sub-Carboniferous formation. Overlying these, and forming the summits both of the spurs and of the main mountain, are the sandstones of the Coal Measures. The northward slopes of these spurs, like those of the main mountain, are very steep, and are composed chiefly of limestones, timbered with fine poplar and walnut trees. At the foot of these slopes is usually a strip of half a mile or more in width with mulatto soils locally noted for their fertility. The summits and very gentle southward slopes have commonly sandy soils and a growth of scrubby oaks and short-leaf pine. The spurs which project farthest north have, as a rule, suffered most degradation, and the sandstone has in many cases altogether disappeared, leaving the limestones as surface rocks. In such cases the usual growth of pine is replaced by cedars. Two of these cedar mountains are situated a few miles southward from Somerville, one of them forming one of the boundaries of Cedar cove. In the eastern part of Morgan county one of the spurs (if it may not even be called the main body of Sand mountain) extends quite up to the Tennessee river near the mouth of Flint river, and on the opposite side a ridge, which is the continuation of it, reaches far up northward into Madison county.

It will easily be inferred from the descriptions above given that the whole of Morgan county was once formed of the Coal Measures, whose general elevation was that of Sand mountain; that these measures also formed the surface of the adjoining counties in the Tennessee valley; and that all the variety now seen in the topography, geological formations, and soils in this region has been brought about by the action of running waters, of which the Tennessee and its tributaries are the present representatives, and which have worn down the surface very unequally, leaving here a portion with nearly its original height, forming the mountains, and cutting down there another portion into channels, forming the present valleys and lowlands. The soils and productions are similar to those of the counties adjoining.

MADISON.

Population: 37,625.—White, 18,591; colored, 19,034.

Area: 810 square miles.—Woodland, all. Red valley lands, 360 square miles; barrens, 150 square miles; calcareous mountain slopes, 100 square miles; Coal Measures table-lands, 150 square miles; sandy lands on smaller mountains, 50 square miles.

Tilled land: 213,221 acres.—Area planted in cotton, 72,838 acres; in corn, 69,246 acres; in oats, 6,877 acres; in wheat, 12,578 acres; in rye, 174 acres; in sugar-cane, 58 acres; in tobacco, 224 acres; in sweet potatoes, 839 acres.

Cotton production: 20,679 bales; average cotton product per acre, 0.28 bale, 399 pounds seed-cotton, or 133 pounds cotton lint.

There are only two geological formations which take any prominent part in the structure of Madison county, the sub-Carboniferous and the Coal Measures; but the former presents three distinct phases, so that the groups of rocks which give rise to well-defined topographical features as well as soil varieties are practically four in number. The lowermost of these groups is composed of highly siliceous or flinty limestones, which, in disintegrating, produce gray, sandy, or gravelly soils of only medium fertility, called, in comparison with the soils derived from the next highest series, "barrens". The topography of this region is much varied and generally rugged.

The limestones which make the next group, though still siliceous, are much less so than those below, and yield soils which are far above the average in fertility. These soils are mostly sandy loams, colored deep-red or reddish-brown with iron, and in some localities, where more calcareous, the color is dark to nearly black, like the prairie soils of middle Alabama. By reason of the comparatively uniform composition of these rocks the surface formed by them is a level or gently undulating plain, dotted here and there with small knolls, composed of the flinty portions of the limestone, and usually covered with a dense growth of oaks and hickories. The great majority of the best farming lands of the Tennessee valley on both sides of the river are of this character.

The next two groups, consisting of the uppermost beds of the sub-Carboniferous formation (called the mountain limestone) and the Coal Measures, are usually associated together, the latter occupying the summits and the former the sides of the mountain spurs and, in some localities, the valleys between them. It has already been stated that the strata of the Coal Measures yield light sandy loams of gray to yellowish colors and of only medium fertility. The mountain limestone yields a variety of soils—black and limy, mulatto, gray, and light sandy, according to locality and circumstances. All these strata are approximately horizontal, but have a slight dip south and west.

That part of Madison county east of Huntsville is formed of the spurs of the Cumberland mountains (detached peaks, groups, and ridges), the remnants of that great table-land continuous in Tennessee, but separated here by valleys. The summits of these mountains are nearly level on top, and are formed of the sandstones of the Coal Measures, and the resulting soils are the light sandy loams before mentioned. On account of their great elevation, 600 or 700 feet above the valleys, and their pleasant climate the mountain summits are, when accessible, desirable places of summer resort, Monte Sano, near Huntsville, being the summer residence of many of the citizens of that town.

The valleys separating the mountain spurs have mostly calcareous soils, and are derived partly from the mountain limestone, as mentioned, and in the deeper valleys, and those which reach down nearest to the river,

from the same beds which make the soils of the red lands of the Tennessee valley. In the former case the soils are black and sticky, like many prairie soils, but these are not very common. Sometimes they are light gray, crawfishy, and not desirable as farming lands. The mulatto soils of this formation are much the best. As a rule, the soils over the mountain limestone are rather thin, as the rock is commonly found along mountain slopes, and, therefore, is much exposed to washing.

The southwestern part of Madison is covered principally by the red or brown soils characteristic of the great Tennessee valley, and it is, taken all in all, the most desirable portion of the county for farming. In general it is level or gently undulating, with a few isolated mountain peaks, which vary the scenery. The northwestern part of the county is occupied by the barrens. The line between these and the red lands is very sinuous, and strips of red land extend far up into the barrens along the water-sheds, in some cases reaching to the state line. On the other hand, the peculiar soils of the barrens are seen along many of the creeks much farther south than their general limit. This distribution will be sufficiently clearly shown upon the map, and the peculiarities of the three most important soils are well presented in the following abstract. Analyses of red lands, barrens, and gravelly creek bottom soils from Madison will be found on pages 31 and 33.

Madison may be taken as the banner county of the Tennessee valley in the production of cotton, both in the percentage of tilled land in cotton and in the number of bales produced. The red valley lands have mostly been long cultivated in cotton and corn, without any adequate return, which accounts for the comparatively low product per acre.

ABSTRACT OF THE REPORTS OF THOMAS B. KELLY, OF CLUTTSVILLE, COLONEL W. C. IRWIN, OF HUNTSVILLE, AND GEORGE D. NORRIS, OF NEW MARKET.

(The first of the reports subjoined refers to the lands drained by Limestone creek and its tributaries, and describes the red limestone land, the barrens, and the flint gravel lands; the second refers to the region drained by Indian and Spring creeks, near Huntsville, and describes only the red valley soil; the third relates to the drainage area of Mountain fork and Hester's creek, both tributary to Flint river. The only soil described is the red clay or limestone soil above named.)

The uplands are in most cases better suited than the bottoms to cotton culture, as the plant matures better and is less liable to injury from frosts and wet weather. In good seasons, however, the lowlands will yield a larger crop and a better quality of cotton than the highlands. The most important soil is that of the red lands, which make about nine-tenths of the cultivated land in the area embraced by the second report, and about two-thirds of the cultivated area of the other two. The prevailing timber is poplar, walnut, hickory, chestnut, black, post, red, and white oaks, ash, elm, etc. The top soil is a sandy clay loam of brown, red, and mulatto colors, sometimes nearly black. The thickness varies greatly with locality, being 1 or 2 feet deep in the lowlands. The subsoil is a red-clay loam, not impervious, becoming darker, like the top soil, under cultivation, and contains commonly angular fragments of flint or chert, underlaid at a depth of 5 to 10 feet by soft, reddish-stained limestone rock. The barrens make a third of the area under cultivation near Cluttsville, but they extend thence all through the northern part of the county. The timber is chiefly post, black, white, Spanish, and black-jack oaks. The top soil is a fine sandy loam, becoming sticky and putty-like when wet, has usually a whitish to gray color, and is on an average 8 inches thick. The subsoil is rather heavier, a yellowish-red sandy material, underlaid with a hard-pan impervious to water at 3 to 5 feet. The flinty gravel soil is of limited extent, being found only along the streams. Its natural timber is beech, poplar, sugar maple, and oaks. The character of the soil is indicated in its name; the color, whitish to gray; thickness, about 12 inches. The subsoil is heavier, and is of a yellowish to red color, and contains many fragments of flint. At 5 to 15 feet depth it is underlaid with a slaty rock.

Land is easily tilled, in dry seasons especially, the principal crops being cotton, corn, oats, etc. The soils are adapted to several crops, but cotton is the chief production, at least half of the cultivated land being planted with it. The average height to which cotton grows is 3 or 4 feet. Deep culture in wet seasons will cause it to run to weed, but this can generally be prevented by shallow culture. The seed-cotton product per acre varies from 800 to 2,000 pounds, and it requires from 1,425 to 1,660 pounds for a 475-pound bale. After ten years' culture without manure the yield varies from 600 to 1,000 pounds per acre. Rag-weed, hog-weed, yellow-dock, and blackberry bushes are most troublesome. Very little land now lies turned out. The slopes or hillsides are much injured by washings from rains. This can be prevented or checked by ditching, which is sometimes practiced with success; but the valleys are generally improved by the washings from the uplands.

The cotton is mostly sold to buyers in Huntsville and other places in the county, and very little of it is shipped by the producer. Occasionally shipments are made to Memphis, Cincinnati, and Nashville, at the rate of 1¼ to 1½ cents per pound. Shipments and sales are made from the time the crop is ready till January, or later.

LIMESTONE.

Population: 21,600.—White, 11,637; colored, 9,963.

Area: 590 square miles.—Woodland, all. Red valley lands, 175 square miles; "barrens," 415 square miles.

Tilled land: 129,477 acres.—Area planted in cotton, 44,334 acres; in corn, 44,612 acres; in oats, 4,134 acres; in wheat, 7,561 acres; in rye, 234 acres; in tobacco, 107 acres; in sweet potatoes, 417 acres.

Cotton production: 15,724 bales; average cotton product per acre, 0.35 bale, 498 pounds seed-cotton, or 166 pounds cotton lint.

Limestone county resembles Lauderdale in its geological structure, surface configuration, and soils, and much that has been said under that county will apply here. A line drawn from the middle of the eastern boundary of Limestone county to its southwestern corner will divide it into two portions, differing widely from each other. North of this line are the barrens, the extension into Alabama of the highlands of Tennessee; south of the line the lowlands of the Tennessee valley. The average height of the former above the valley lands is not less than 200 feet, but this increases going northward. The valley lands themselves are some 100 feet or more above the level of the Tennessee river. Immediately adjoining the river are the first-bottom lands, which are not above overflow. These three terraces (if they may be so called) have their distinctive features. The bottom lands proper are nearly level, and have the usual fertile sandy loam soils, which are much better suited to the production of corn than to that of cotton. The valley lands are also nearly level, or only gently undulating, with here and there a rocky knoll covered with timber. The rest of the valley, as already stated, is almost entirely cleared and under cultivation.

The rock underlying this portion of the county is a limestone of sub-Carboniferous age, more or less impregnated in places with chert or siliceous matter. As the rock disintegrates under the influence of the atmospheric agencies the indestructible flinty portions are left, forming the rocky knolls, which are not generally cultivated, but which often form the sites of the farmers' houses. The soils derived from this limestone are clay loams of red, brown, and almost black colors; and the subsoil is nearly always a heavy, red clayey loam, which assumes the characters of the top soil after cultivation. This rests upon the limestone at depths which vary with the locality, the black soils being those in which the influence of the limestone is most strongly felt. These are the true cotton lands, and yield, when fresh, from 1,000 to 1,500 pounds of seed-cotton to the acre. The timber which still remains upon the rocky knolls is composed of the various species of upland oaks, hickory, ash, gums, etc.

These rocky knolls are usually of comparatively small extent. "Nubbin" ridge, however, which seems to have a similar origin, is an exception, for it is quite high and broad, and extends from the near vicinity of the Tennessee river northward to the region of the barrens. The boundary-line between this county and Madison runs along the top of this ridge for many miles. The summit of the ridge is much less encumbered with the fragments of chert than are most of the rocky knolls of similar origin, and there are upon it many spots of fair cotton land. As a general thing, however, the soil seems to be badly worn, and old fields, gashed with gullies and grown up in briers, are more often seen than cultivated lands. On account of the fine water everywhere to be had on the ridge, its pleasant climate, and its elevation, this ridge was once to a greater degree than at present the place of residence of planters whose farms were situated in the more productive but less salubrious lowlands.

The valley lands are bounded on the north by the foot-hills of the highlands, and the line of separation is an exceedingly irregular one. The surface of this transition region is much more broken than that of the valley lands on the one side or of the barrens on the other.

In general, the barrens have the characters of a tolerably level plateau, the surface of which has been cut into deep, narrow ravines by the streams. But in this respect the western part of the county is quite different from the eastern. The tributaries of Elk river, on the west, are confined to deep and narrow gorges, and have very little first- and second-bottom lands.

In the vicinity of any of these streams, but especially of Elk river, are the river hills, which make a distinct agricultural division. The manner in which they have been formed may be explained by the following considerations: Elk river flows down a basin 3 or 4 miles in width, bordered on each side by cliffs, more or less abrupt, of the rocks which form the barrens. The river follows a winding course down this basin, impinging first against the one side and then against the other, leaving on one side only a narrow strip of bottom lands between it and the cliff. On the opposite side, however, the cliffs are some 3 miles away, and the space between them and the river has been much eroded and is now dotted with hills having steep sides, sometimes isolated, and covering an area of 25 or 30 acres, sometimes connected together by low ridges. There is very little level land on top of these hills, which are the only relics left of the land degraded by the short tributaries of the river. The soil of the hillsides is red and quite fertile, and generally in cultivation; but the hills have the disadvantage that the soil is very difficult to retain, as it is liable to be washed away by every hard rain because of the steep slopes. Such are the river hills, which are much desired as farming lands, notwithstanding the natural disadvantages to which they are subject.

In the eastern part of the county the basins of the creeks are shallower, with gently-sloping sides, and include often considerable bodies of very good land. The upper part of Elk river also has some very good tracts of second-bottom land, the river hills being, as a rule, absent in that section. The fertile areas found in these positions among the barrens are, in all probability, derived from some of the lower and more purely calcareous beds of the generally highly siliceous strata of the lowest division of the sub-Carboniferous formation. On account of a gentle dip toward the south, these lower beds, composed in the main of very impure siliceous limestones, while they form the surface rocks in all the northern half of the county, in the barrens, in the lower half, pass beneath the purer and less siliceous limestones of the upper division of the sub-Carboniferous formation which make the valley lands. This valley limestone, however, is never very thick on the northern side of the Tennessee river, at least as far eastward as Decatur; and along the river banks, and in places also along the smaller streams, the underlying rocks of the barrens are exposed in every cliff.

The line of separation of the barrens from the valley lands is, as before stated, quite irregular, for the rocks of the former along the creek basins reach far down into the valley, sometimes even to the river, while, on the other hand, the red soils of the valley may frequently be found upon the summits of the dividing ridges, reaching up into the barrens for long distances. The town of Athens stands upon one of these prolongations of the red lands, and in the northern part of the county there are a few isolated spots of this red land still left upon the higher summits.

Agriculturally, Limestone is like Madison county, except that in Limestone there is a smaller proportion of red valley land and a larger proportion of barrens. The area planted in cotton yields an average return, although the majority of the lands are much worn and have had comparatively little help from fertilizers.

ABSTRACT OF THE REPORT OF F. H. PEEBLES, OF MOORESVILLE.

(The region referred to is drained by Piny, Limestone, and Beaver Dam creeks, all tributaries of the Tennessee river.)

The two principal soil varieties described are the red-clay lands and the light, sandy bottom lands of the Tennessee, and only the red lands are mentioned in detail. These form about 90 per cent. of the area reported upon, and the natural growth is composed of ash, hickory, gum, and species of oaks. The greater part of the timber has been removed and the land brought under cultivation. The top soil is a red-clay loam, as a rule, though other colors are noticed. The average thickness is 4 inches, and the subsoil is heavier, but of the same general character with the soil. It contains, especially near the water-courses, rounded and angular pebbles of quartz and chert.

Tillage is easy, except directly after hard rains or in excessively dry seasons. The chief crops are cotton and corn, and the soil is about equally well suited to each. A little more than half of the area is put in cotton, which grows to a height of from 1 to 6 feet, being most productive at 3 feet. The plant inclines to go to weed during wet fall weather, and the only remedy suggested is topping. The seed-cotton product per acre on fresh land is from 1,000 to 1,500 pounds, and 1,780 pounds are required to make a 475-pound bale, the staple from fresh land rating as middling. After fifty years' cultivation, without manure, the yield is brought down to 300 pounds, with

about the same quality of staple, and about the same proportion between the lint and seed. The most troublesome weed is crab-grass. About one-tenth of the land originally cultivated is turned out, but when again taken into cultivation it produces very well. There is comparatively little injury from washings, either to the uplands or the valleys.

Shipments of cotton are made from October to January, both by steamer and by rail, usually to Memphis or Cincinnati, and the rate of freight is from $2 to $2 25 per bale.

LAUDERDALE.

Population: 21,035.—White, 14,173; colored, 6,862.

Area: 700 square miles.—Woodland, all. Barrens, 400 square miles; red valley lands, 200 square miles; gravelly hills, with short-leaf pine, 100 square miles.

Tilled land: 102,839 acres.—Area planted in cotton, 26,594 acres; in corn, 42,890 acres; in oats, 4,609 acres; in wheat, 8,475 acres; in rye, 262 acres; in tobacco, 105 acres; in sweet potatoes, 467 acres.

Cotton production: 9,270 bales; average cotton product per acre, 0.35 bale, 498 pounds seed-cotton, or 166 pounds cotton lint.

To present in a satisfactory manner the topography and soil distribution of Lauderdale county it will be necessary to refer to its geological structure. The entire county is immediately underlaid with the rocks of the sub-Carboniferous formation and with the lower strata of the same. These are of two sorts, the upper beds being more calcareous and the lower more flinty or siliceous, and the soils derived from them vary accordingly. All these beds have a gentle slope or dip southward, by which circumstance the lower or more siliceous beds, while forming the immediate surface in the northern part of the county, are in the vicinity of the Tennessee river at considerable depths below the surface, which is formed of the overlying more calcareous rocks. The areas where these two classes of rocks form the surface differ widely in their topography, soils, and other features.

The northern part of the county (five-sevenths), formed by the siliceous beds, is an elevated plateau, a part of the highlands of Tennessee; the southern part (two-sevenths), where the calcareous beds make the surface, is a portion of the great valley of the Tennessee.

The first of these two areas is called the highlands, or barrens, and it may be described as a high plain, much cut up by deep, long, narrow ravines, which extend north and south, and from which branch off other smaller ravines, all occupied by streams during the winter months. This area becomes more broken and rugged southward, where on the borders of the valley land it is cut up into a maze of hills and ridges, with hollows or coves between, across which—*i. e.*, east and west—it is almost impossible to construct a passable road. The broken character of the country and the formation of the deep, narrow ravines, with nearly perpendicular sides, are due to the comparatively indestructible rock which lies near the surface. The disintegration of this rock, which is a highly siliceous limestone, in places almost a flint rock, gives rise to the formation of the barrens soil, a light-gray siliceous soil, which, as compared with the valley soils, is rather poor, but, as analysis and practice both show, by no means merits the name of barrens. The characteristic timber consists of post and black-jack oaks and short-leaf pine. To these are added other trees, according to variations of the soil. Along the creeks and ravines are found the finest white and red oaks, poplars, chestnuts, etc. These lands have always considerable elevation above the sea (250 feet above the level of Tennessee river, increasing toward the north). There is comparative immunity from malarial disease, the soils are more easily worked, and the cotton matures earlier, and gives often a better staple. For these reasons the lands of the barrens are gradually being brought into cultivation. Analyses of soils of this kind from Madison county have been given (see page 31).

The second of the areas above mentioned is known as the valley of the Tennessee, and constitutes in Lauderdale county a strip of gently undulating, nearly level land about 100 feet above the river and some 4 or 5 miles wide. The line separating this from the highlands is very irregular, especially in the western part of the county. The valley soils vary from red or brown loams to a dark or nearly black calcareous loam. They are all fertile and stand cultivation well, some of them having been tilled for the past 75 years (practically without manure), and yield at the present day tolerably fair crops. The natural growth consists of the various species of oaks and hickories, but most of the best lands have long since been denuded of their native forests. The limestone, which forms the substratum of the valley lands, is, in general, somewhat siliceous, though sometimes quite pure, the less pure or more siliceous portions of the limestone, in disintegrating, giving rise to the formation of rocky knolls, which are usually covered with the original timber, and form agreeable interruptions to the otherwise somewhat monotonous scenery. On these knolls frequently stand the houses of the planters. A marked feature of the valley region which is underlaid with this limestone is the great abundance of big springs and sink-holes.

The drainage of Lauderdale county is all southward into the Tennessee river by streams which have their headwaters in the highlands of Tennessee. Some of them have cut down through the limestones of the country into the rocks of still older formations, though these take no part in the formation of the soils.

In the western part of the county the calcareous rocks above mentioned are covered with beds of varying thickness of pebbles and sand of the stratified drift formation. Where these beds form the surface, they give rise to the formation of soils of the kinds often previously described. A conglomerate or sandstone made of these materials, cemented by iron, is of frequent occurrence in this part of the county. The ridges, which have generally a more or less sandy soil, are timbered with post oaks and short-leaf pines. Some of the springs of the county have a reputation for medicinal properties, the best known of these being Bailey's springs, not far from Florence. West of the town of Florence, in the great bend of the river, is the largest body of valley land in the county. It is known as the Colbert reservation, and embraces some fine farms. The valley land is said to produce, when fresh, as much as 1,000 pounds of seed-cotton to the acre, and is excelled by few tracts in the county. The yield of the better class of barrens in seed-cotton is given at 600 pounds. From the character of the topography, the bottom lands within the region are quite narrow.

By far the greater proportion of the cotton of Lauderdale county is produced upon the red valley lands, which form a good deal less than one-half the area of the county. The product per acre is above the average, and the percentage of tilled land in cotton is also quite high.

ABSTRACT OF THE REPORT OF JAMES WILLIAM MORGAN, OF FLORENCE.

(This report refers to the valley lands and river bottom in the Colbert reservation.)

The lowland cotton is liable to rust and shed in wet seasons, and is more likely to be killed by early frosts than that planted in the higher valley lands. For these reasons very little of the bottom lands is cultivated in cotton in the region under discussion, corn being the universal crop. The valley lands proper, about 100 feet above the river level, are the cotton lands. The soil varies with the location. The timber consists of hickory, post, black, red, and black-jack oaks, poplar, dogwood, etc. The top soil is a fine sandy or gravelly loam of a yellowish-brown to orange-red color, 12 to 18 inches in thickness, resting upon a tough reddish-clay subsoil, which, when undisturbed, is quite impervious. It contains numerous angular fragments of flint or chert, remnants of the siliceous portions of the limestone rock which underlies the subsoil at a depth of 8 to 10 feet on an average.

Land is generally easily tilled in dry seasons. The chief crops are cotton, corn, wheat, oats, sorghum, and sweet potatoes, and all these crops are good under favorable surroundings. At least two-thirds of the land, however, is planted in cotton, which in very wet seasons is inclined to run to weed; but this can often be prevented by not plowing too near the plants, and by topping, though the latter is sometimes dangerous. The seed-cotton product per acre when land is fresh is from 750 to 1,000 pounds per acre. This cotton rates as good ordinary to low middling. After five years' culture without fertilizers the yield per acre is from 500 to 600 pounds, but somewhat less of this is required for a bale. Crab-grass, smart-grass, and careless weeds are most hurtful. About one-third of the land is turned out, which, when reclaimed, produces very well if not too much washed. The slopes or hillsides are sometimes seriously damaged by washings; but the valleys are sometimes injured, sometimes improved, by the washings of the uplands—depending on the character of the deposit. Circling and ditching to some extent prevent injury to hillsides from rains.

Shipments of cotton are made from November to July, usually by steamboat to Cincinnati, the freight to that point being from $1 to $1 50 per bale.

LAWRENCE.

Population: 21,392.—White, 12,642; colored, 8,750.

Area: 790 square miles.—Woodland, all. Red valley lands, 260 square miles; calcareous land along mountain slopes and in coves, 220 square miles; sandy lands of Little mountain, 150 square miles; Coal Measures, 160 square miles.

Tilled land: 138,034 acres.—Area planted in cotton, 42,803 acres; in corn, 54,643 acres; in oats, 5,691 acres; in wheat, 5,919 acres; in rye, 117 acres; in tobacco, 105 acres; in sweet potatoes, 379 acres.

Cotton production: 13,791 bales; average cotton product per acre, 0.32 bale, 456 pounds seed-cotton, or 152 pounds cotton lint.

The plateau of the Warrior coal-field terminates in the lower part of Lawrence county, in a mountain escarpment 250 or 300 feet in height overlooking the Moulton valley. This mountain forms the divide between the waters flowing into the Tennessee and those flowing into the Warrior river. Between Moulton and Courtland there is another range (called the Little mountains) running east and west. This ridge is cut by all the streams flowing north into the Tennessee, and separates the Moulton valley on the south from the Tennessee valley on the north. The county is thus divided into four belts: two with prevailing sandy soils, formed by the two mountain ridges, and two with calcareous soils, occupied by the two great valleys mentioned. The geological formations which enter into the structure of the county are the sub-Carboniferous and the Coal Measures. The rocks of the latter are found only upon the summit of Sand mountain, and therefore only in the southern part of the county, while the sub-Carboniferous rocks underlie the rest of it. The soils of Sand mountain, like those of the Coal Measures generally, are sandy loams of no great fertility, but, holding well all fertilizers, are coming much into notice lately.

The sub-Carboniferous rocks, while mainly limestones, have near the top of the series a bed of sandstone of considerable thickness and of great importance in the topography and soil formation in this and adjoining counties; for the Little mountain range owes its existence to the protection afforded by a capping of this rock against the denuding forces which carved out the two valleys which it separates. The main body of the Little mountains is made up of limestones, which are passed over in ascending the mountain from either side, and it is only the summit that is occupied by the sandstone. The soil derived from this rock is a sandy loam, an analysis of which from La Grange, Colbert county, is given on page 34, and supports the usual growth characteristic of sandy soils, viz, short-leaf pine and post and black-jack oaks. In some places the sandstone is absent over considerable areas on the summit of the mountain, and the underlying limestones make the surface, forming limy or prairie soils. A tract of this prairie land about a mile and a quarter wide and 15 miles long extends along these mountains from the western part of the county a mile or less into Franklin county. This is a level piece of land, mostly uncultivated, but thickly carpeted with grass, through the soil of which in many places the bare limestone rock protrudes. Where the soil is deep enough it is said to be well suited to the cultivation of wheat, which comes to maturity before the dry weather of the summer sets in; to other crops this land is not suited, since, on account of the proximity of the underlying rock to the surface, the soil suffers much from drought. Throughout this prairie are scattered groups of trees, which afford good shade to cattle, and thus enhance the value of the land as pasture grounds. The characteristic growth is persimmon, haw, cedar, gum, and honey-locust. Along the sides of the mountain it is not uncommon to find narrow ledges with level surface of this kind of soil.

Both the great valleys in this county have flinty limestones for a substratum, and the soils and topography are determined by these rocks. The valley in which Moulton is situated is about 5 miles wide, and extends nearly through the county, merging into the mountain lands toward the east, but being more open toward the west. The valley of the Tennessee has the same general characters, but is wider and much more uniform in its features, and is, in general, a level plain with a red sandy loam soil of great natural fertility. The greater part of this plain is under cultivation, but the cleared lands are dotted here and there with beautiful groves of hickory and oaks, which cover the rocky knolls made by the disintegration of the more siliceous portions of the valley limestone. As already stated, these knolls are often selected as building spots, and many of them are adorned with handsome houses. Toward the river the valley limestone thins out, and along the banks of that stream the siliceous rocks which underlie it are exposed in bluffs of considerable height. The general level of the great valley may be put at about 100 feet above the river. The Tennessee bottom lands are loose sandy loams, very productive, but in general better suited to the production of corn than to that of cotton.

The outline of the Little mountains against the Tennessee valley is very irregular, and is a succession of projecting mountain spurs, often with a face of nearly perpendicular cliffs, alternating with limestone coves. Near the heads of these coves are sometimes found scenes of great wildness and beauty. In all the valley the lands are much worn from continuous cultivation, without return.

ABSTRACT OF THE REPORTS OF COLONEL JAMES E. SAUNDERS AND DR. F. W. SYKES, OF TOWN CREEK.

(The region described is that drained by Town and Big Nance creeks.)

This region is less liable to be visited by the caterpillar, and is also less liable to failures of the cotton crop by reason of wet weather than are the cotton lands farther south. On account of the sandy nature of the soil the crops mature better in the Tennessee valley than in regions with a different soil. Better average crops are made here than in the rich black canebrake belt farther south. The chief soils of the valley are the level uplands, the sandy creek bottoms, and dark sandy bottom lands of the Tennessee river. Of these only the first will be described in detail. This forms nine-tenths of the cultivated lands of the valley, and was originally timbered with post oak and hickory, and some black-jack oak; later a growth of red oaks has sprung up. The top soil is a fine sandy ferruginous loam of a mahogany to reddish color, with an average thickness of 6 inches. The subsoil is heavier, being a clayey loam of a dark-red color. It bakes hard when plowed too wet; yet it crumbles readily when exposed to the rain, and holds fragments of chert, rounded and angular, and full of the impressions of fossils. The subsoil is underlaid with a limestone rock at 10 to 20 feet depth.

Lands are easily cultivated in both wet and dry seasons. The chief crops are cotton and corn, two-thirds of the land being devoted to the former. In rich soil cotton grows 5 or 6 feet high, but is generally most productive when 3 feet in height. On rich land, in wet weather, the cotton is much inclined to run to weed. The seed-cotton product per acre is about 1,200 pounds, *i. e.*, a 400-pound bale, and it rates in the market as good middling. After eight years' culture without fertilizers the yield per acre is 800 pounds; after fifteen years' culture it is 650 pounds, and 500 pounds after thirty years. It requires somewhat less seed-cotton than from fresh land to make a bale. About one-tenth of the land originally cultivated is turned out; but when reclaimed, it produces well if manured and properly cultivated. Uplands are much damaged by washings.

Shipments of cotton are made from November 1 to January 1, usually by railroad to Memphis, Nashville, and Cincinnati, at the rates of $2 15 to $2 75 per bale.

COLBERT.

Population: 16,153.—White, 9,203; colored, 6,950.

Area: 570 square miles.—Woodland, all. Gravelly hills, 250 square miles; sandy soils of the Little mountains, 170 square miles; red valley and other calcareous soils, 150 square miles.

Tilled land: 74,876 acres.—Area planted in cotton, 25,411 acres; in corn, 31,575 acres; in oats, 3,846 acres; in wheat, 1,704 acres; in rye, 69 acres; in tobacco, 34 acres; in sugar-cane, 15 acres; in sweet potatoes, 286 acres.

Cotton production: 9,012 bales; average cotton product per acre, 0.35 bale, 498 pounds seed-cotton, or 166 pounds cotton lint.

East and west through Colbert county runs a range of hills called the Little mountains, north of which lies the valley of the Tennessee and south Russell's valley. Toward Russell's valley the slopes of these hills are covered with thick beds of pebbles, but toward the Tennessee valley the mountain sinks down rather abruptly, leaving an escarpment not covered by pebbles. The Little mountains are composed entirely of the strata of the sub-Carboniferous formation, which also form the substratum of the valleys on each side. These strata are, in the main, limestones, with a bed of sandstone of considerable thickness near the top of the series. This bed of sandstone forms the summit of the Little mountains, which owes its present elevation above the valleys to the protection against the denuding forces afforded by this rock. The average height of the mountains above the valleys is some 300 or 350 feet.

All the streams of the county flow into the Tennessee, and all have their sources in the mountains south of Russell's valley, in Franklin county. In their courses toward the Tennessee they have, especially westward, cut gorges or small cañons into the sandstones which form the upper stratum of the Little mountains. After leaving the mountain, they flow through the comparatively level valley toward the river. In these mountain gorges are many scenes of wild and rugged beauty; and it is not strange that the chalybeate springs, which are so common here, have been favorite places of resort.

The soils, which have been derived from the sub-Carboniferous rocks, are of two kinds: sandy and calcareous. The former are, as a rule, found upon the summit of the Little mountains; the latter in the valleys. The general characters of the sandy soils may be learned from the analysis given of a soil from La Grange (page 34). The calcareous valley soils are of two principal sorts, according to the locality: (1.) Over most of the valley the soil is a reddish loam, with yellowish or reddish clay subsoil, and where the soil is directly upon the limestone, and much affected by it, the color is inclined to be dark to black, like highly calcareous soils of other regions. (2.) In the bottoms and lowlands generally the soils are looser and more sandy or gravelly. The valley lands are timbered with a fine growth of oaks and hickories, and make an attractive country. The sandy mountain lands are timbered chiefly with post oaks and short-leaf pines.

Pebbles and beds of stratified drift cover all the western part of the county within 8 or 10 miles of the Mississippi line, and the soils, derived altogether from these beds, are very little, if at all, affected by the underlying calcareous strata of the sub-Carboniferous formation. In all this part of the state sandstones and conglomerates are of frequent occurrence, formed by the cementing together, by hydrated oxide of iron, of the sands and pebbles of the drift. Nearly every hill or ridge has upon it a capping of this sort of rock. Pine (short-leaf) and post oak form the prevailing timber on all these gravelly and sandy lands. As previously stated, the beds of drift cover also the southern slopes of the Little mountains toward Russell's valley as far east as Frankfort. In this respect Russell's valley differs from that of the Tennessee.

Analyses of the Tennessee valley soil and of the gravelly or river hills soil have been given on pages 33 and 34, and they, together with the analysis of the mountain soil from La Grange, exhibit the characters of the principal soils of Colbert county.

Colbert differs from the other counties of the Tennessee valley, except Franklin and Lauderdale, in the circumstance that a considerable proportion of its soils is made by the drift, and they are, to a certain extent, independent of the underlying rocks of the country.

ABSTRACT OF THE REPORTS OF L. B. THORNTON, OF TUSCUMBIA, AND OF T. B. BICKLEY, OF SPRING VALLEY.

(These reports refer to the valley lands within 10 or 15 miles of Tuscumbia.)

The higher-lying lands of the valley are best suited to cotton, which in the flats or basins is liable to injury from wet seasons and early frosts. These higher lands are excellent farming lands, and there is scarcely ever a failure in the crop. As usual, wet seasons, late, cold springs, and early frosts are circumstances of climate which interfere with the growth of the plant.

The principal soil varieties are brown loam, with red-clay subsoil, and the sandy mountain soil. The former, with its many variations, forms the greater part of the Tennessee valley within the county limits; the latter is found in all the mountainous region in the southern portion of the county. The prevailing timber upon the brown-loam lands is made up of red, white, black-jack, post, and chestnut oaks, hickory, chestnut, black walnut, and gums. The soil is a clayey loam of a brown to nearly black color, 1 to 2 feet in thickness, with a subsoil of red clay, which becomes like the surface soil upon cultivation, and both soil and subsoil frequently contain angular fragments of the flinty or cherty portions of the rocks from which they are derived. The subsoil rests on limestone rock at depths varying with the locality and is porous, and all these lands are naturally well drained. The mountain lands have a growth of chestnut, post, white, and chestnut oaks, with short-leaf pine. The soil is a coarse, sandy loam of a whitish to gray color, and quite thin. The subsoil is rather heavier, and contains occasionally rounded pebbles of quartz and fragments of the underlying rock, which is a sandstone, and usually at no great depth from the surface.

Land is somewhat difficult to cultivate in wet seasons, but can be tilled early when well-drained. The principal crops are cotton, corn, wheat, oats, clover, and potatoes, and all succeed well. About one-half of the valley and one-fourth of the mountain land is planted in cotton. The usual height of the plants is from 3 to 5 feet in the valley and 2 feet on the mountain, production being most rapid just before growth is completed. In wet seasons cotton planted close in the drill is inclined to run to weed, but this can be prevented by thinning out to proper distance and by topping. On fresh land the product per acre of valley land is about 1,200 pounds of seed-cotton—800 pounds on mountain—and it requires from 1,660 to 1,780 pounds for a 475-pound bale. The cotton thus produced generally rates as good middling to good ordinary. After ten years' continuous culture in cotton the yield is only 600 to 800 pounds per acre, 400 on mountain land: but there is no change in the amount required for a bale. Crab-grass, hog-weeds, and careless weeds are most troublesome. At least one-third of the valley and one-half of the mountain land originally in cultivation is now turned out, but when restored to cultivation it generally produces about as well as fresh land. The slopes or hillsides are washed into gullies unless measures are adopted to prevent washing, but the valleys are often benefited by washing from the uplands.

Shipments of cotton are made mostly in November and December, by rail and river, chiefly to Memphis, at the rate of $2 per bale by rail and $1 50 by river. Occasionally shipments are made to other ports.

FRANKLIN.

Population: 9,155.—White, 8,079; colored, 1,076.

Area: 610 square miles.—Woodland, all. Red valley and other calcareous lands, 220 square miles; sandy soils of the Little mountains, 40 square miles; gravelly hills, 200 square miles; Coal Measures, 150 square miles, in great measure, however, covered with drift.

Tilled land: 46,895 acres.—Area planted in cotton, 10,368 acres; in corn, 21,038 acres; in oats, 3,020 acres; in wheat, 1,660 acres; in tobacco, 17 acres; in sugar-cane, 96 acres; in sweet potatoes, 137 acres.

Cotton production: 3,603 bales; average cotton product per acre, 0.35 bale, 498 pounds seed-cotton, or 166 pounds cotton lint.

The northern half of Franklin county is a valley known as Russell's valley; the southern half is high table-land, the northern edge of the Warrior coal-field. Most of the streams of this county rise at this foot of the escarpment which separates the valley from the table-land and flow northward into the Tennessee. Big Bear creek takes its rise south of this escarpment and flows at first southwestward, as though a tributary of the Tombigbee, but its course is soon changed to westward and then northwestward by an accumulation of pebbles and sand, and it breaks through this mountain escarpment into the valley and flows thence northward into the Tennessee. This pebble ridge is a noticeable feature in the topography of Franklin county. Overlying the strata of the Coal Measures, it forms an irregular crescent, beginning in the southeast of Franklin, bending down into Marion, and returning again into Franklin county near its southwestern corner. The waters north of this ridge flow into the Tennessee; south of it into the Tombigbee. The extraordinary deflection of Big Bear creek, caused by this ridge, has been mentioned under Marion county. The waters of Big Bear creek, on the north, are some 50 feet or more higher than those of the tributaries of the Tombigbee river on the south, though the two are only a few miles apart.

The geological formations concerned in the structure of Franklin county are three in number, viz: the sub-Carboniferous, the Coal Measures, and the stratified drift, and their surface distribution is in general as follows: The table-lands are formed by the second, the valley by the first, while the drift overlies both in the western part of the county, and to some extent also in other portions. To go more into detail, the northern limit of the Warrior field is an exceedingly irregular line, formed by projecting ridges, with limestone coves between. East of Russellville these mountain prongs extend northward as far as the middle of township 7, and a few project still further northward. West and southwest of Russellville the line is still less regular, and cannot well be described without the aid of a detailed map. The irregular line of mountain spurs, with interlocking coves, runs from Russellville south and southwest to near the middle of township 8, range 14 west, and thence southward into Marion county. Except near the southern line of the county the strata of the Coal Measures are found only near the summit of the mountain, and are therefore of no great thickness, the sides of the mountain, as well as the valley below, being formed of the calcareous rocks of the sub-Carboniferous formation.

The soils derived from the disintegration of the strata of the Coal Measures are, as usual, sandy and not very fertile, but the calcareous rocks above mentioned give rise to soils which are above the average in fertility. The soils of the drift have already been frequently described. The best cotton lands are found in Russell's valley, and the soil best suited to this crop is a red or mulatto-colored loam with red or yellow clay subsoil. Where the limestone reacts upon the soil, this is often of a black color, much like the black prairie soils of the lower part of the state. The deep color is due to the presence of vegetable matter and its rapid decay under the influence of the lime. The bottom lands partake, as usual, of the characters of the uplands from which they are derived, but are, as a rule, rather more sandy. In the western part of Franklin county the beds of stratified drift overlie the other

formations, and the soils are derived from the loam and other strata of this superficial covering. In the eastern part of the county the table-lands before spoken of are about 250 or 300 feet above the general level of the valley; but westward the height decreases somewhat, and the escarpment which forms the southern limit of the valley loses its importance west of Russellville, both because of the diminished height of the escarpment itself and because the beds of drift have filled up the valley.

In cotton product per acre Franklin ranks well with the Tennessee Valley counties, and its soils, both those of the red valley lands and those derived from the drift, are well suited to the production of this staple.

ABSTRACT OF THE REPORT OF DR. DANIEL N. SEVIER, OF RUSSELLVILLE.

(This report treats of the region drained by Cedar creek, a tributary of Big Bear creek.)

The uplands here referred to are in the valley, and not upon the table-land, and are hilly, with thin soil, mixed with sharp, angular fragments of flint and cherty gravel. This soil has a red or a buff clay subsoil. Either cold or wet injures the growth of cotton, causing it to die out or become lousy. Protracted wet spells cause it to shed its squares, and early frosts kill the top bolls. Hot, dry weather is best for cotton. No damage is done by the caterpillar or boll-worm in this part of the state.

The four principal soil varieties are, in the order of their importance in cotton cultivation, the red or mulatto lands, the hilly lands, with thin soils and red or buff-colored clay subsoils, the black sandy alluvial lands, and the black lime-lands. The red or mulatto lands are much the best for cotton. They form most of Russell's valley, which is from 6 to 8 miles wide, and extends from the adjoining county on the east to 7 miles west of Russellville. The prevailing timber is red, white, and black oaks, poplar, hackberry, black walnut, cherry, and hickory. The soil is a coarse sandy or gravelly loam, sometimes a heavier clay loam, of buff to brown or nearly black color. The thickness is 10 to 15 inches, and the subsoil a red or buff clay. When well plowed this soil produces good crops and stands drought well.

The hilly land produces good crops both of cotton and of corn, and other crops as long as it lasts, and rests upon a red or buff clay foundation, but washes badly into deep gullies, and the lowlands are filled up with great heaps of gravel. The black sandy alluvial lands are subject to overflow, and are well suited to corn, but not to cotton. The black lime-land is also well suited to corn, but the cotton grows too rank upon it, and is likely to take what is called the black rust. In some localities this land rests upon a bed of limestone at varying depths. These lands are alluvial in character.

The chief productions are cotton, corn, oats, and potatoes, but the soils are generally best adapted to the two crops first named. About two-thirds of the red land is planted in cotton, the plants attaining a height of from 1 to 3 feet, and usually producing more or less according to the height. Cotton often runs to weed on rich land in wet weather, but this can be checked by topping. The seed-cotton product per acre is from 800 to 1,200 pounds, and 1,545 pounds are reckoned to a 475-pound bale. Crab-grass and hog-weeds are most troublesome on this soil. The slopes are much damaged by washings, and not much effort is made to prevent or check the injury.

The cotton crop is usually hauled on wagons to Tuscumbia or some other station on the railroad, and thence shipped to Memphis or other ports by the purchasers. The freight to Tuscumbia will average perhaps $1 50 per bale. Most of the shipments are made during the autumn and winter.

OAK AND HICKORY UPLANDS, WITH SHORT-LEAF PINE.

This region includes the following counties, wholly or in part: Lauderdale,* Colbert,* Franklin,* Marion, Lamar, Fayette, Walker,* Pickens, and Tuscaloosa.*

LAUDERDALE.

(See "Valley of the Tennessee".)

COLBERT.

(See "Valley of the Tennessee".)

FRANKLIN.

(See "Valley of the Tennessee".)

MARION.

Population: 9,364.—White, 8,841; colored, 523.

Area: 810 square miles.—Woodland, all. Coal Measures, 660 square miles; gravelly pine hills, 150 square miles. (The drift makes a certain proportion of the soils and subsoils over the entire county, but on the west the underlying formations are completely hidden.)

Tilled land: 42,925 acres.—Area planted in cotton, 7,269 acres; in corn, 21,835 acres; in oats, 2,321 acres; in wheat, 3,925 acres; in tobacco, 44 acres; in sugar-cane, 15 acres; in sweet potatoes, 477 acres.

Cotton production: 2,240 bales; average cotton product per acre 0.31 bale, 441 pounds seed-cotton, or 147 pounds cotton lint.

The area drained by the Buttahatchie river and its tributaries includes the greater part of Marion county. The headwaters of this stream rise at the western foot of a ridge of sand and pebbles known as Byler ridge, which extends from Tuscaloosa county northward through Fayette, Walker, and Winston counties to the southern limit of the great valley of the Tennessee. Another ridge of similar structure, but much smaller, in the northeastern corner of the county turns the waters of Big Bear creek to the north. Most of the tributaries of the Buttahatchie river in Marion county flow southward from this ridge, as do also the tributaries of Bull Mountain creek, in the

northwestern corner of the county. The bed of Big Bear creek is considerably higher than that of the headwaters of Buttahatchie river and of Bull Mountain creek, which are distant from it only a few miles, and a comparatively short canal would suffice to turn the waters of Big Bear creek in a torrent into either of the others.

The geological structure of Marion county is in its general outline quite simple, its substratum being formed of the sandstones, shales, and conglomerates of the Coal Measures, which are covered with a capping of pebbles, sand, and other beds of the stratified drift. The general slope of the underlying beds is toward the southwest, and the thickness of the superficial deposits increases in the same direction. In the eastern part of the county even the smaller streams have cut their channels through the thin drift-covering into the underlying Coal Measures, but in the extreme west none but drift beds are exposed, even in the deepest drainage cuts.

The soils in the west are, in consequence, derived almost exclusively from the overlying drift beds, and are of the usual characters so often described. The uppermost 20 or 25 feet are usually formed of a stiff red loam, which rests upon the beds of pebbles and sand which make up the greater part of the formation. The red loam, therefore, commonly occupies the higher table-lands and the level second bottoms, where erosion has been least effective. Upon the hillsides and slopes the other beds of the drift come to the surface, and the soils derived from them are much less fertile. The surface soil of the red loam is usually a sandy loam of a brown color, from the addition of vegetable matter, and the growth upon it is that of the brown-loam uplands everywhere.

The high table-lands of Marion county furnish superior farming lands, desirable on account both of the natural fertility of the soil and of their favorable position with respect to drainage, etc. In those parts of the county where the strata of the Coal Measures are near the surface the sandstones and conglomerates form bluffs in all the ravines. Underneath the overhanging cliffs, or "rock houses," as they are locally termed, grow abundantly some of our rarest and most beautiful ferns, such as *Trichomanes radicans*, *Asplenium pinnatifidum*, *Asplenium montanum*, *Trichomanes Petersii*, etc.

Many of the upland soils, especially in the western part of the county, are quite productive, and with better facilities for shipping the crop Marion would take a fair rank among the northern counties in the production of cotton.

ABSTRACT OF THE REPORT OF MARTIN NESMITH, OF PIKEVILLE.

(This report refers to the lands drained by Beaver creek, a tributary of the Buttahatchie river.)

Two-thirds of this area is hilly, and is not in cultivation; the remaining portion table-lands and bottoms. The soils, more than the climate, influence the growing of the cotton, for in the low, wet lands the plant weeds well, but does not mature. The uplands and second bottoms, especially when well fertilized, make the best crops, and the plant matures well, the staple being both longer and better. The soil varieties described are the brown-loam lands, the black sandy lands, and the swampy or low marshy lands.

The first forms one-half or more of the cultivated lands in the region described, and is timbered with white, black, and red oaks, hickory, short-leaf pine, beech, and black and sweet gum. The soil is a dark or brown sandy loam of 5 or 6 inches in thickness, resting on a reddish clayey subsoil, which is underlaid with sand and gravel.

The black sandy lands form one-third of the cultivated lands in the region, and this soil occurs in patches of from 25 to 30 acres, alternating with flinty or gravelly lands. The natural growth is short-leaf pine, hickory, post and red oaks, and chestnut. The soil is a sandy or gravelly loam, heavier clayey loam in places, of an average thickness of 6 inches; the subsoil a tough, whitish clay, which bakes very hard, and does not pulverize under cultivation. It contains often white, rounded, and angular pebbles, and rests upon beds of sand and gravel at a depth of 3 or 4 feet.

The swamps or marshes form the third variety of land, and occupy about one-sixth of the area. The timber is composed of white oak, sweet and black gum, beech, poplar, bay, etc., and the soil is a whitish or gray clayey loam, quite thin (2 inches), with a subsoil of heavy clay. This soil, being very thin and whitish, is poor, and does not pay to cultivate.

Tillage is usually difficult only in wet seasons. The principal crops are cotton and corn, the soil being generally best adapted to the former crop. About one-half of the land is planted in cotton, which attains a height of from 2 to 5 feet. In late planting, on low wet land, the cotton plant generally runs to weed, but this can be prevented by early planting and the use of fertilizers. The yield per acre is about 400 pounds, and it generally requires 1,425 pounds of seed-cotton to a 475-pound bale. After ten years' continuous culture without manure the land will not yield more than 300 pounds per acre, and of such cotton it will take 1,545 pounds of seed-cotton to the bale. Hog-weeds, rag-weeds, and burrs are the usual farm nuisances. About one-fourth of the land originally cultivated now lies turned out; but when such land has lain idle several years it will produce good crops. There is some hillside ditching to prevent gullies, but the valleys are generally benefited by washings from the uplands.

The shipments of cotton are made in November and December, by railroad, to Mobile, at the usual rate of $1 per bale; but the fact that there is no railroad in this county tells against the production of cotton, which has often to be hauled many miles in wagons.

LAMAR.

Population: 12,142.—White, 9,967; colored, 2,175.

Area: 590 square miles.—Woodland, all. Pebbly hills, 550 square miles; Coal Measures, 40 square miles.

Tilled land: 62,141 acres.—Area planted in cotton, 15,245 acres; in corn, 28,303 acres; in oats, 4,139 acres; in wheat, 5,627 acres; in rye, 75 acres; in tobacco, 46 acres; in sweet potatoes, 626 acres.

Cotton production: 5,015 bales; average cotton product per acre, 0.33 bale, 471 pounds seed-cotton, or 157 pounds cotton lint.

Lamar county is wholly upon the belt of stratified drift which covers the line of junction of the older and newer formations in Alabama. Its surface, therefore, is formed by the sands, clays, and pebble beds of this formation and of the rocks which are produced by the cementing together, by hydrated iron oxide, of these materials. A bed of varying thickness of red loam or red clay nearly always forms the surface unless removed by denudation. The soils, consequently, vary from stiff reddish loams, becoming brown upon the addition of vegetable matter, to light sands. The natural growth varies similarly from the luxuriant timber of the oak uplands to that of the black-jack ridges, which, in addition to the oak, often support a growth of short-leaf pine.

From observations made in the adjoining counties, it seems probable that the strata of the Coal Measures underlie the beds of drift; but as yet these rocks have not been noticed. The hills separating the streams in the eastern part of the county are from 250 to 300 feet in height above the water-courses, and are composed

throughout of the materials of the drift. Pebbles are found as usual below the capping of red loam, which here, as elsewhere, forms the surface. Where thin beds of clay underlie the loam or other strata it is not unusual to find a thin layer of ferruginous sandstone or conglomerate, formed by the cementing together of the sand or pebbles by the oxide of iron which is so universally diffused through this formation as coloring matter. The somewhat hard rocks formed in this way often protect from denudation the underlying strata, and are commonly found upon the summits of the hills, which owe their existence to the protection thus afforded.

The drainage of Lamar county is southwest into the Tombigbee by the Buttahatchie river and Luxapolila creek and their tributaries. The main water-sheds are usually table-lands with brown-loam soils and reddish subsoils, such as have been described at length under Pickens and other counties. The average height above drainage of the table-lands, like that of the highest hills of the minor water-sheds, is some 250 or 300 feet.

ABSTRACT OF THE REPORT OF GEORGE E. BROWN, OF CANSLER.

(This report refers to the region drained by Beaver creek and Buttahatchie river and their tributaries.)

In the second bottoms cotton yields more to the acre than upon the uplands, but is liable to be cut off prematurely by frosts. Throughout the county the soils are more or less sandy in texture, and are timbered with short-leaf pine, the various species of oak, hickory, ash, chestnut, and sassafras. The top soil varies from light sandy to a rather stiff clay loam of whitish, yellow, red, and blackish colors, and the subsoil is usually somewhat heavier, and of a reddish to yellow color, containing pebbles in size from a buckshot up. The subsoil rests on a clay, and this on beds of pebbles and sand. The lands are easily tilled under all circumstances, and the chief crops are corn and cotton. It is thought that corn succeeds best, though the soil is well suited to each.

Nearly half of the tilled land is in cotton, which attains heights varying from 3 to 6 feet, being most productive at medium heights. The plant tends to run to weed when there is an excess of rain during its earlier stages, and no remedy is suggested. The seed-cotton product per acre of the fresh land is from 600 to 1,200 pounds, and 1,485 pounds are needed to make a 475-pound bale. The staple rates about low middling. After three or four years' cultivation without manure the yield falls off considerably. The staple from the worn land is shorter than that from the fresh, but it is good, and requires a little more of the seed cotton to make a bale. The most troublesome weed is crab-grass and, in rich spots, cocklebur. About one-eighth of the land originally in cultivation now lies turned out. If not hilly, such land, when reclaimed, produces about as well as when fresh. The soil is of such a nature that it washes badly on slopes, though the injury from this cause is not very great. If the valleys are very narrow, they are injured by being covered with sand, but no serious efforts have been made to check this evil.

Cotton is usually hauled to Columbus and Aberdeen, Mississippi, the nearest market on a railroad.

FAYETTE.

Population: 10,135.—White, 8,873; colored, 1,262.

Area: 660 square miles.—Woodland, all. Coal Measures, 600 square miles; gravelly pine hills, 60 square miles (but the gravel and other drift beds overlying the Coal Measures to some extent over the entire county, it is only in the 60 square miles above noted that they hide completely the lower rocks).

Tilled land: 56,118 acres.—Area planted in cotton, 12,331 acres; in corn, 24,950 acres; in oats, 3,627 acres; in wheat, 4,826 acres; in rye, 46 acres; in tobacco, 37 acres; in sweet potatoes, 421 acres.

Cotton production: 4,268 bales; average cotton product per acre, 0.35 bale, 498 pounds seed-cotton, or 166 pounds cotton lint.

There are two principal systems of drainage in Fayette county: one into the Warrior river, and the other into the Tombigbee. These are divided by a sinuous ridge having a general northern and southern direction, and known as Byler ridge. Upon this ridge, for most of its length, is an old thoroughfare, the Byler road, much used in former times. The Warrior system may be still further divided; for a part of the water reaches the Warrior river southeastward through Lost, Cane, and Wolf creeks, while a greater part flows southward through the North river and its tributaries. The Tombigbee drainage is in general southward in three narrow belts not more than 5 or 6 miles wide east and west. The widest of these areas is that of the Sipsey, or New river; the next is drained by the Luxapolila, and the third by Hell's creek and Yellow creek, both tributaries of the Luxapolila. The ridges separating these areas are simple ridges of denudation, and the average height above the streams is about 250 or 300 feet.

The character and distribution of the soil varieties of Fayette county depend upon the relations of the two geological formations which enter into its structure. These are the Coal Measures and the stratified drift. The surface formation over the whole county, except in valleys excavated by the various streams, is the latter; but beneath it, at depths varying with the locality, may always be found the sandstones, shales, and other strata of the Coal Measures. West of the Luxapolila river no Coal Measures have been noticed, for the reason, probably, that the drainage has not cut deeply enough to expose these underlying beds. In the extreme eastern part of the county the soils depend in great measure upon the strata of the older formation, but in the rest of the county they depend upon the drift alone.

The most important and widely spread soil is a brown loam with red clayey-loam subsoil, with timber of post, red, and black-jack oaks, chestnut, short-leaf pine, etc., such as characterizes the oak uplands in various parts of the state. This soil is derived from red loam, which, as a rule, forms the capping over the sands and pebbles of the stratified drift. It grades off on the one hand into sandier, and on the other into more clayey varieties, with corresponding changes in the timber. There are two principal soil-varieties derived from the strata of the Coal Measures. These are the sandy soils of the sandstones and conglomerates and the clayey soils of the shales of these measures. These soils, however, do not differ essentially from the sandy and loamy soils of other origin. Soils similar to those of Fayette are described in the abstracts under Winston and Marion counties.

There being as yet no railroad through Fayette county, the cotton produced there must be hauled in wagons many miles, either to the Mobile and Ohio road, in Mississippi, or to Tuscaloosa. This lack of transportation is a serious hinderance to the production of cotton, and the small number of bales given above is due to the small acreage. The soils are above the average in fertility.

Fayette county might have been classed with the oak uplands region, since the prevailing cultivated soils are those which characterize this region.

WALKER.

(See "Coal-Measures region".)

PICKENS.

Population: 21,479.—White, 9,132; colored, 12,347.
Area: 1,000 square miles.—Woodland, all. Gravelly pine hills, 950 square miles; prairie, 50 square miles.
Tilled land: 115,560 acres.—Area planted in cotton, 52,651 acres; in corn, 43,104 acres; in oats, 8,053 acres; in wheat, 2,220 acres; in rye, 36 acres; in tobacco, 51 acres; in sugar-cane, 19 acres; in sweet potatoes, 757 acres.
Cotton production: 17,283 bales; average cotton product per acre, 0.33 bale, 471 pounds seed-cotton, or 157 pounds cotton lint.

The soils, topography, and other natural features of Pickens county are dependent almost entirely upon a single formation, the stratified drift, which makes the surface over all, except the extreme southwestern corner of the county, where the calcareous beds of the Cretaceous formation are exposed. All the drainage is into the Tombigbee river by Sipsey river and Bear, Lubbub, and Coal-fire creeks. The face of the country throughout the county is quite broken, as is always the case where the drift is the prevailing formation. This is well illustrated between Tuscaloosa and Carrollton, where the road passes over a succession of little hills, separating the drainage areas of the creeks. The prevailing timber here is a mixture of the upland oaks with short-leaf pine. With the loam soils, which prevail, there is in places a large proportion of clay coming from the drift beds, and where this material is abundant the soil is quite stiff and the post oak forms the principal tree. South of Carrollton the lowlands of Lubbub creek, 1 or 2 miles in width, form excellent farming land. The divide between this and Blubber creek is a fine table-land with brown-loam soil, timbered with the upland oaks, and very fertile.

Southwest of a line joining Pleasant ridge, in Greene county, with Pickensville the Cretaceous strata form the country, but do not in any great degree influence the soils on the northeastern side of the river; but beyond it the prairie soils of the usual character make their appearance, forming the great proportion of the lands in the southwestern corner of the county. Drinking water in this region is obtained from bored or artesian wells, as the surface water at certain seasons is both scanty in quantity and of poor quality.

The upland soils of Pickens vary from the best brown to sandy loams, and all rest upon red-clay loam, which itself is generally underlaid with sand and pebbles. The bottom and hummock lands in the greater part of the county have in general the characters of the loam uplands which adjoin them, and are in many cases of superior quality. Southwest of the river the topography is less varied than elsewhere, the country being gently undulating, with low ridges of drift to relieve the monotony. The soils in this part of the county are the usual rotten-limestone prairie soils and the varieties resulting from the intermixture of this with the surface loams of the drift.

In its agricultural features Pickens county resembles its neighbors, and presents no special peculiarities.

ABSTRACT OF THE REPORTS OF M. F. COOK, OF PICKENSVILLE, AND R. F. HENRY, OF COLUMBUS, MISSISSIPPI.

(These reports relate to the bottom and uplands of Coal-fire creek and to those of McBee creek, both streams tributary to the Tombigbee river.)

Late springs, with cold rains, sometimes cause poor stands of cotton, and late frosts kill the young plants. In the northern part of the county the uplands are generally poor from long and careless cultivation; yet the few level spots are still quite productive. The bottom lands generally produce good crops of cotton, except in a few cases where the soil is gravelly. When planted in time and properly cultivated the whole crop will generally open before killing frosts. On the uplands of the central and southern parts of the county cotton rarely fails, especially if fertilizers are applied before planting. The western part of the county is a good cotton country, and entire failures of the crop are unknown.

The most widely-spread soil in the county is the brown loam of the uplands, which varies from a rather heavy and fertile to a light sandy loam. The subsoil in most cases is a stiff, reddish clayey loam, sometimes yellow, with sand and gravel underlying at varying depths. Now and then there are patches of crawfishy soil, with whitish clay beneath. The timber of the uplands consists of pine, red, black, Spanish, and black-jack oaks, hickory, chestnut, etc., with white, water, and willow oaks, ash, cypress, beech, sweet and sour gums, and other growth in the lowlands.

The lowlands and bottom lands have generally a "made soil", which is a light loam, more or less sandy, of dark, sometimes black, colors. These also have usually a red-clay subsoil, much like the subsoil of the adjacent uplands. The soils of the bottoms are often of considerable thickness; that of the uplands varies greatly, being in places almost entirely washed off. From one-half to three-fourths of the county has a sandy soil, especially on the water-sheds, and this soil has a natural growth of pine, mixed with the several species of oaks, and with hickory where of better quality. These soils are of gray to dark colors, and sometimes a foot or more in thickness. The subsoils are also sandy, holding pebbles.

These lands are generally easy to cultivate. The chief crops are cotton, corn, oats, and potatoes, but the soil is best adapted to cotton, potatoes, and oats. More than one-half of the cultivated land is in cotton. The height to which cotton grows varies from 2 to 6 feet. Rich bottom lands, when cultivated too deep in wet seasons, make the cotton run to weed, but this can be prevented by underdrainage, shallow culture, and topping. The seed-cotton product per acre on fresh land is about 1,000 pounds, and it requires 1,545 pounds to make a 475-pound bale; but the staple is not as good as that from old, fertilized land. After two or three years' culture the yield is increased, but after five years the uplands begin to wash, and there is a falling off in the yield; but the bottom lands are as productive now as 20 years ago. Morning-glory, crab-grass, and purslane are specially troublesome. Only a small part of the uplands is turned out. Such turned-out lands will produce well if Japan clover cover them one or two years. The hillsides and slopes are somewhat injured by washings, but this may be and is prevented by ditching, underdraining, etc.

The cotton crop is largely sold to cotton buyers in the local markets. When shipped to Mobile the freight is $1 25 per bale. The shipping is by the Tombigbee river, and is usually done between November and February.

TUSCALOOSA.

(See "Gravelly pine-hills region".)

GRAVELLY HILLS, WITH LONG-LEAF PINE.

This region includes parts of Pickens,* Tuscaloosa, Greene,* Hale,* Bibb, Perry,* Chilton, Autauga, Elmore, Montgomery,* Tallapoosa,* Macon,* Lee,* and Russell.*

PICKENS.

(See "Oak and hickory uplands, with short-leaf pine".)

TUSCALOOSA.

Population: 24,957.—White, 15,216; colored, 9,741.

Area: 1,390 square miles.—Woodland, all. Four hundred square miles are pebbly pine hills (250 square miles with short-leaf pine and 150 with long-leaf pine), and, in addition to this, of the 965 square miles of the Coal Measures 675 square miles have the characters of the pebbly pine-hills, and 225 square miles have the short-leaf and 450 square miles the long-leaf pine; 25 square miles in Roup's valley.

Tilled land: 111,171 acres.—Area planted in cotton, 33,773 acres; in corn, 38,638 acres; in oats, 6,974 acres; in wheat, 2,689 acres; in rye, 130 acres; in sugar-cane, 35 acres; in tobacco, 20 acres; in sweet potatoes, 919 acres.

Cotton production: 11,137 bales; average cotton product per acre, 0.33 bale, 471 pounds seed-cotton, or 157 pounds cotton lint.

A line drawn from the northwestern to the southeastern corner of Tuscaloosa county through or near the city of Tuscaloosa will divide the county into two parts of unequal size, differing widely in soils, topography, and other natural features. North and east of this line the county is formed of the sandstones and shales of the Coal Measures; south and west, of the sands and loams of the stratified drift formation. These last-named materials, however, overlie the rocks of the Coal Measures in a belt 12 or 15 miles wide, lying northeast of the line alluded to. Southwest of this line the drift hides completely from view any underlying rocks, but northeast the Coal Measures are everywhere brought to light where the former has been removed by erosion. In the southeastern edge of the county, adjoining Bibb, there is a narrow belt, in Roup's valley, where the rocks of a still lower geological formation take part in the formation of the soils and in the production of scenery.

The Black Warrior river, which flows in general southwest through the center of the county, receives nearly all the drainage, and the Sipsey river, a tributary of the Tombigbee, drains the northwestern corner. This river is separated from North river, the principal tributary of the Warrior, by a ridge of sand and pebbles of the stratified drift, known as Byler ridge, upon which was one of the principal thoroughfares of the county before the days of railroads.

In all that part of the county where the rocks of the Coal Measures are at the surface the soils are mostly sandy, occasionally shaly or aluminous, and seldom very fertile. The uplands are timbered with the usual variety of oaks, hickory, and pine, and bring tolerably fair crops. In this part of the county the bottom lands of the river and creeks are most esteemed by farmers. From the northeastern corner down nearly to the city of Tuscaloosa the river bottoms are rather narrow, except in the great bends, and in some parts of its course, as at the Squaw shoals, the river flows between high, rocky banks, with almost no bottom lands on either side. The adjacent uplands, also formed by the same rocks, are very rugged, difficult to cultivate, and rather poor. A large area in the northeastern part of the county is thinly settled, but the woods are well stocked with deer and other game, which find excellent pasture in the grasses and leguminous plants which there abound. Below Tuscaloosa the river bottom (partly above overflow) to the lower limit of the county will average 1 mile in width, and has a reddish loamy soil and red subsoil, derived from the uplands, and forms the best farming area of the county. In all the southwestern part of the county, where the stratified drift is at the surface, the topography shows the usual variety characteristic of this formation.

From the lowlands along the river there is usually a rather abrupt rise of from 60 to 75 feet to a terrace or plain, which is often 5 or 6 miles wide. Upon this stands the beautiful city of Tuscaloosa. From this plain the ground rises from the river, sometimes gradually, sometimes abruptly, to the general level of the uplands, which upon the main water-sheds is not less than 250 or 300 feet above the water-courses. This elevation is not reached in the lower part of the county usually within 10 miles of the river. Throughout this part of the county the prevailing soils are brown loams of considerable fertility, overlying subsoils of red clayey loam, which in turn rest upon beds of gravel and sand. The bottom lands are more or less closely related to the uplands from which they are derived, but are usually rather more fertile, containing, as they do, the cream of the upland soils.

At some distance from the river, upon the water-sheds spoken of above, the soils are somewhat more sandy. The long-leaf pine grows upon the sandy soils in all the southwestern part of Tuscaloosa county, and also east and northeast of the city of Tuscaloosa for a distance of 25 or 30 miles, or nearly to the county limits. In these localities the rocks of the Coal Measures are covered with beds of pebbles and sand of the drift. The genuine piny woods are here, as elsewhere, rather poor and thinly settled, but, with a moderate outlay for manures, they yield very fair crops of cotton.

The greater part of the cotton crop of Tuscaloosa county is raised upon the soils derived from the drift and loam, and comparatively little upon those of the Coal Measures.

ABSTRACT OF THE REPORTS OF HON. A. C. HARGROVE AND JAMES R. MAXWELL, OF TUSCALOOSA.

(Both reports refer to the bottom lands of the Warrior river and the adjacent uplands.)

The growth of the cotton-plant depends to a great extent upon the temperature and humidity. In the bottom lands it is likely to be late, and therefore more exposed to frosts and the ravages of the caterpillar; and for these reasons the uplands are preferred for cotton where the soils are at all fair. On the uplands the cotton grows off well about the last of April, and matures about the third week in September. The picking sometimes begins the last week in August. On manured or fresh land it continues to make till frost; the most of it, however, is made by the middle of September.

The bottom lands of the Warrior river and tributary creeks are of two principal kinds, the stiff, yellowish soil and the loose gray. The two together make up the soils of the bottoms from Tuscaloosa to the southern limit of the county with a width of 1 mile and a length of 25 or 30 miles. The natural growth consists of beech, white and red oaks, sweet gum, poplar, elm, and cottonwood, with occasional dense thickets of cane. The stiff soil is a heavy clayey loam of a gray to yellow color, sometimes inclined to be black, especially when wet. The thickness varies from 8 to 12 inches. The subsoil is sometimes heavier, sometimes lighter, than the surface soil, and is of a yellowish or buff color when dry. When the surface soil is washed away, this subsoil appears to be almost barren, though shown by chemical analysis to be rich in potash and phosphoric acid. The barrenness is due to the physical condition. When dry, the subsoil becomes very hard, but absorbs water rapidly, and then becomes a sticky clay. It contains now and then soft, black gravel, and the whole is underlaid at varying depths by beds of sand and gravel. The stiff, yellow soils are difficult to cultivate, except in the proper seasons, for they are too sticky in wet and too hard in very dry weather. The loose, gray bottom soils are always easily tilled. The stiff soils are inclined to be late, cold, and ill-drained, while the loose gray soils, on the contrary, are early and warm.

The soil next in importance is the brown loam of the uplands. This makes from one-half to two-thirds of the uplands, the rest being sandy, piny woods. The timber consists of post, red, Spanish, and black-jack oaks, hickory, poplar, and short-leaf pine. The soil is in general a brown loam from 3 to 10 inches in thickness, with a heavier subsoil of reddish clay, which is often almost impervious. The subsoil rests upon beds of sand and gravel, occasionally mixed with clay, and often contains pebbles. These upland soils are early and warm when well drained, which is the case with most of them.

The long-leaf pine woods make up a considerable proportion of the highest uplands. The natural growth is the long-leaf pine, with black-jack and other species of oaks where the soil is more fertile. The soil is a light-colored, sandy loam, 2 or 3 inches in thickness, resting upon a sandy subsoil which often contains rounded pebbles of quartz. These sand and gravel beds underlie also the subsoil to considerable depths. The soils are always easily tilled.

The chief crops are cotton, corn, and oats, but many other crops grow well. The soil generally is perhaps best adapted to cotton, but bottom lands produce fine crops of corn. Fully one-half of the tillable lands are devoted to cotton culture. On bottom lands cotton grows from 5 to 8 feet high, on uplands from 3 to 4 feet, the latter being generally most productive. Cotton is inclined to run to weed on rich sandy bottoms in rainy weather. On the best lands the bale of 500 pounds is produced, but the average yield is a bale to three acres. A 475-pound bale requires from 1,545 to 1,630 pounds of seed-cotton. The fresh-land cotton is usually graded as middling uplands. Morning-glory, hog-weed, and crab-grass are specially troublesome. About one-fourth of the land originally tilled is now turned out, which produces well for two or three years, and then rapidly deteriorates. The slopes are much injured by washings; on the other hand, the valleys are often improved by the washings of the top soil from the uplands. The damage to slopes is prevented or checked by hillside ditching.

The cotton is shipped, as fast as prepared for the market, usually to Mobile, either by rail or by boat. The freight by rail is from $1 75 to $2, and by boat from $1 25 to $1 50 per bale.

GREENE.

(See "Central prairie region".)

HALE.

(See "Central prairie region".)

BIBB.

Population: 9,487.—White, 5,887; colored, 3,600.

Area: 610 square miles.—Woodland, all. Hilly lands with long-leaf pine, 310 square miles; 125 square miles in Cahaba coal-field; 100 square miles in Roup's valley; 75 square miles valley lands south of the Cahaba coal-field. About 120 square miles of the southern parts of the coal-field and the valleys are covered with the drift, and exhibit the characters of the gravelly hills with long-leaf pine.

Tilled land: 43,796 acres.—Area planted in cotton, 15,737 acres; in corn, 18,816 acres; in oats, 2,935 acres; in wheat, 3,125 acres; in rye, 151 acres; in tobacco, 36 acres; in sugar cane, 36 acres; in sweet potatoes, 368 acres.

Cotton production: 4,843 bales; average cotton product per acre, 0.31 bale, 441 pounds seed-cotton, or 147 pounds cotton lint.

The northwestern corner of Bibb county is occupied by the narrow trough of Roup's valley, which is well-defined as far south as the base line between the two surveys (which runs east and west about 12 miles north of Centerville). Below this the sands, loams, and pebbles of the drift hide all the underlying formations. The characters of Roup's valley, with its parallel ridges and subordinated valleys, have been given under Jefferson county.

In Bibb county the ridge which occupies the central part of the valley is quite conspicuous, and is in many places filled with iron ore of good quality. It embraces many acres of fine farming land where not too much broken. The color of the subsoil is usually a deep-red; the soil is more sandy and of a brown color. Between this and the red-ore ridges, which are found near the margins of the valley, but not always prominent landmarks, are belts of valley land with gray and yellowish to red soils and red subsoils, mostly under cultivation. The quality of these soils varies with the locality. As a rule, they contain angular fragments of chert derived from the flinty limestones upon which they are mostly based. Of considerable extent also is a gray, gravelly soil, with light-colored subsoil, filled with fragments of flint. Between the red-ore ridges and the extreme margin of the valley on each side there are narrow depressions with a first-rate yellowish calcareous soil.

East of Roup's valley, and occupying the northeastern part of the county, are the Coal Measures of the Cahaba field. The southwestern limit of this field is near Scottsville. It is drained by the Cahaba river, and forms a very rugged and broken area, with prevailing sandy soils of no great fertility. Near the confluence of Shade's creek with this river is a region known by the expressive name of "the Uglies", almost uninhabited, and embracing some of the most broken land in the county. As a rule, the area formed by these Coal Measures is not densely populated, as the soil is not productive enough to offer any inducements to the settler.

Between the southern edge of the coal-field and a line running from Centerville northeast to the county line there is an area of valley land with flinty ridges and the other characteristics of the valley lands of central Alabama. In this area there are many tracts of fine farming land, with red, buff, and gray soils, derived from the cherty or flinty magnesian limestones of the country, and giving evidence of their origin in the great number of angular fragments of chert with which they are filled. The red lands are more fertile and better suited to the grain crops, while the gray lands, sandy, and timbered with pines, are preferred for cotton.

South of Pratt's ferry a mountain rim, composed of the chert of the sub-Carboniferous formation, incloses a basin of 2 or 3 square miles area with yellowish soil, differing from the usual red valley soils and derived from an entirely different series of rocks. This has its representative in the Dry valley soil of Cherokee county, an analysis of which has been presented on page 25.

The southern part of the county, embracing the lower 12 miles, depends for its topography and surface features essentially upon a single formation, the stratified drift. This formation consists of beds of sand, pebbles, and loam of great thickness, which overlie and hide from view the older rocks. The cultivated soils are mostly derived from a bed of red loam, which is usually the uppermost of the whole series, and which is nearly always prominent in the subsoils. In this part of the county the ridges and depressions are determined solely by the water-courses, and do not lie in parallel, sharply-defined belts, which are so characteristic of the upper part. The high lands separating the main streams have a brown-loam soil resting upon this red loam as subsoil. Its timber is a mixture of the various species of upland oaks, and as the top soil becomes more sandy the long-leaf pine associates itself with these, and the transition into the long-leaf pine woods takes place by gradual stages. Wherever the soil is very sandy or pebbly and the subsoil light the long-leaf pine is the prevailing growth.

Agriculturally, Bibb county shares the characteristics of the valley region and those of the pine hills and brown-loam uplands, the greater part of the cotton crop being raised upon the brown-loam soils. The subjoined report does not refer to any of the brown-loam or sandy soils, and for descriptions reference must be made to the descriptions under Perry, Hale, and Tuscaloosa counties, where entirely similar soils prevail.

ABSTRACT OF THE REPORT OF J. S. HANSBERGER, OF TIONUS.

(This report refers to the region of Six-Mile creek, a tributary of the Cahaba river.)

The two principal soil varieties described are the red clay loam lands and the gray sandy lands, which make about equal proportions of the region under consideration. The timber of the red lands is composed of oak, hickory, walnut, and poplar on the red lands, and chiefly of long-leaf pine on the other. The top soil of the red lands is a clay loam of a red to brown color from 2 to 10 inches in thickness, resting upon a subsoil which is of heavier quality and of deeper red color. This subsoil often becomes hard and almost impervious. The top soil of the gray lands is of lighter color and more or less sandy, and its subsoil is of a yellowish color, somewhat sandy also, and seldom becoming hard and "panny".

The cultivation of the land is easy in dry weather, but somewhat difficult in wet seasons. The chief crops are cotton, corn, wheat, oats, rye, barley, and sweet potatoes. The red lands are adapted to corn, cotton, and wheat; the gray lands to cotton and potatoes. About one-third of the land is planted in cotton, which grows to the average height of 3 feet. Deep culture and wet weather will make cotton run to weed. The yield per acre on fresh land is from 500 to 1,000 pounds, and it requires from 1,545 to 1,660 pounds to a 475-pound bale. The cotton from fresh lands rates as low middling. After ten years' culture (unmanured) the yield is from 400 to 800 pounds per acre. Rag-weed is most numerous after wheat and other small grain, while crab-grass is most troublesome in the cultivation of cotton. About one-third of the land originally cultivated is now turned out, and some portions of this land, when taken into cultivation again, produce well, but other portions are worthless. The washings of the slopes is being checked to a considerable extent by hillside ditching.

The cotton is shipped, as soon as prepared for the market, by railroad, mostly to Selma. The farmers sell most of their cotton to merchants, and these ship it. The usual freight charge to Selma is from $1 50 to $2 per bale.

PERRY.

(See "Central prairie region".)

CHILTON.

Population: 10,793.—White, 8,651; colored, 2,142.

Area: 700 square miles.—Woodland, all. Four hundred square miles of gravelly hills with long-leaf pine; 220 square miles metamorphic slate region; 80 square miles valley lands, Silurian, etc. (Part of the last two divisions are also covered with drift and partake of the characters of the gravelly pine-hills.)

Tilled land: 40,676 acres.—Area planted in cotton, 11,558 acres; in corn, 18,185 acres; in oats, 2,255 acres; in wheat, 4,507 acres; in rye, 60 acres; in sweet potatoes, 356 acres.

Cotton production: 3,534 bales; average cotton product per acre, 0.31 bale, 441 pounds seed-cotton, or 147 pounds cotton lint.

The eastern part of Chilton county is formed by the crystalline rocks, the western part by the strata of the drift formation, and at the line of separation of the two, which is approximately along the line of the North and South Alabama railroad, there is a high ridge of the drift which forms the water-shed between the Coosa and the Alabama rivers. In many places this water-shed is 300 feet above the immediately adjacent streams. The course of the Coosa river, which forms the eastern boundary of Chilton, is nearly parallel with this ridge.

In addition to the above-named formations, there appear in the upper part of the county certain Silurian strata, which, however, are, as a rule, more or less covered with the beds of drift, and therefore not solely concerned in

the formation of the soils. Near Verbena, in the belt of crystalline rocks, there is an occurrence of hornblendic rocks which yield red and brown soils, and south of these are chiefly mica slates, yielding sandy gray soils, with much long-leaf pine associated with the oak growth. Northward from Verbena the gray soils prevail, and the long-leaf pine is nearly always present among the trees. Immediately north of the belt of red-colored soils mentioned as occurring near Verbena there is an area, formed by a much-decayed mica slate of purplish tinge, which yields an extremely sterile soil, upon which the chief growth is stunted long-leaf pines and black-jack oaks. In this region the surface is much broken. These slates are traversed by veins holding large masses of mica, which may some day be profitably worked. Northward from this the rocks are mostly siliceous and clay slates, with gray soils; long-leaf pine timber prevails, and the surface in places is exceedingly broken. The highest land in the county is probably to be found in this region. Of the specific characters of the red and gray soils here occurring little need be said, since similar soils have been mentioned under all the counties in which the crystalline rocks are more widely distributed.

The western part of the county formed of the strata of the drift presents the usual variety which characterizes that formation everywhere. These soils vary from the rich red and brown loams of the oak and hickory uplands to the gray sandy soils of the pine woods.

The water-shed mentioned as lying on the eastern border of the drift area is in general a high table-land with gray sandy soil and a splendid growth of long-leaf pine timber, supplying some of the largest saw-mills in the state, located along the line of the North and South Alabama railroad. This pine region extends southward into Autauga and Elmore counties, and analyses of several typical soils of these pine forests in the former county have been given on page 39.

Westward in the drainage area of Mulberry creek and of the other small streams of the county brown-loam soils of very good character are found and are in cultivation. This part of the county also is much more densely populated and is of much more importance, agriculturally, than the eastern, where the pine timber and the mineral resources are the chief interests.

The agricultural capabilities of Chilton county are quite similar to those of Autauga on the one hand, and of Coosa on the other.

Cotton is hauled to the stations on the North and South Alabama and Selma, Rome, and Dalton railroads, and there sold to merchants, who ship it thence to the various markets.

AUTAUGA.

Population: 13,108.—White, 4,397; colored, 8,711.

Area: 660 square miles.—Woodland, all. Gravelly hills, with long-leaf pine, 560 square miles; calcareous lands, 100 square miles.

Tilled land: 81,388 acres.—Area planted in cotton, 30,474 acres; in corn, 20,417 acres; in oats, 2,153 acres; in wheat, 700 acres; in rye, 63 acres; in rice, 43 acres; in sugar-cane, 22 acres; in sweet potatoes, 540 acres.

Cotton production: 7,944 bales; average cotton product per acre, 0.26 bale, 372 pounds seed-cotton, or 124 pounds cotton lint.

Autauga county is one of the counties situated upon the great pebble bed which covers and hides from view the line of contact of the older crystalline or metamorphic rocks and the newer Cretaceous, and, as might be expected from this circumstance, its upland soils are almost exclusively derived from these drifted materials.

The northern two-thirds of the county, viz, townships 18, 19, and all of 20 which lies within the county, are piny-woods land, hilly and timbered with long-leaf pine, and often with no other tree, except the black-jack oak. In many places, especially north of Kingston, even an undergrowth of shrubs is wanting, but grasses and leguminous plants flourish and afford excellent pasturage. The soil is coarse to fine sandy and often gravelly, and the red or yellow loam is almost entirely wanting, except in the subsoil, often at a considerable depth from the surface. In these lands only the hollows and creek flats are worth cultivating, and perhaps not more than one acre in thirty is, or ever has been, cleared up and in cultivation.

Coming southward, there is, as a rule, an improvement in the land, and pine land with red clay or clayey loam subsoil makes up a good part of townships 17 and 18. Some of these soils have a sandy subsoil; that is, the loam lies deeper below the surface. Nearly all the pine lands with clay subsoil have been cleared up, not because they are better in the virgin state than the soils with sandy subsoil, but because they lie better, are more level, and consequently last longer. As to productiveness, they are about equal, the fresh land yielding about 400 pounds of seed-cotton to the acre. About one-fifth of township 17 is table-land, level, and having an average elevation above the water-courses of 225 or 250 feet. The rest of the township is made up of the steep hillsides which border these table-lands and the creek hummocks, which are very much like the river hummocks. From the piny woods of the upper townships two strips of pine land run down into this township (17): the one, on the borders of Autauga creek, to the river; the other, on Whitewater creek, to within 2 miles of the river.

The table-lands have a natural growth consisting of short-leaf pine, red, Spanish, black, and post oaks, hickory, dogwood, black gum, etc. These have a clay foundation, and will yield, when fresh, from 1,000 to 1,200 pounds of seed-cotton to the acre. The same is true of the hillsides, which are good farming lands when level enough to plow and can be protected from washings.

There are two outcroppings of the calcareous rocks of the Cretaceous formation in the county, viz: one, about 5 miles long, lying between Nolan's and Bear creeks, in township 17, on the plantation of General Fair; the other near the river below the Dutch bend. Taken together, the area of these Cretaceous or prairie tracts is small, only about 10 sections. All of this kind of land that is level enough to plow has been cleared up, and it is equal to, or perhaps better than, any land in the county, yielding, when fresh, from 1,200 to 1,500 pounds of seed-cotton to the acre.

Nearly all of township 16 in this county is second-bottom or river-hummock land, and most of it is in cultivation. In this township also are the first bottoms of the Alabama river, which are very rich and productive; but being liable to overflow in the spring, are devoted almost entirely to corn, the yield of which is from 40 to 50

bushels to the acre. An analysis of a specimen of river-bottom soil from this county has been given on page 40. The hummocks and the table-lands are about equally productive, giving, as above stated, from 1,000 to 1,200 pounds of seed-cotton.

For many of the above-named facts I am indebted to Dr. S. P. Smith, of Prattville.

The southern boundary of Autauga county is made by the Alabama river, and the sandy loams of the second-bottoms of this river and of the streams that flow into it have produced the great proportion of the cotton crop. The calcareous lands in the southwestern part of the county, while of limited extent, are very superior cotton lands. The red or brown-loam table-lands also furnish fine plantations, but much of this land is badly worn, although, with proper care, susceptible of almost unlimited improvement.

ABSTRACT OF THE REPORT OF DR. C. M. HOWARD, OF MULBERRY.

(The region reported upon is in township 17, range 13, in the drainage areas of Beaver and Ivy creeks, and embraces the bottom lands of those streams, and also the hilly and table-lands of the same drainage area.)

The soils vary from tolerably stiff to light sandy clay loams, and include also the creek bottoms. The most important are the red land (loam soil), occupying about one-half to three-fourths of the region described. The timber consists of post, white, and red oaks, hickory, short-leaf pine, chestnut, dogwood, and sassafras. The thickness of the red soil is from 1 to 4 inches, the subsoil generally heavier, a close clay, often plastic, and containing occasionally pebbles. Beneath the subsoil are either sand, pebbles, or clay at varying depths. Alternating with the loam soils above named, and forming perhaps a fourth of the area under discussion, are the sandy lands with timber of long-leaf pine and black-jack oaks, and occasionally other species of oak. This is a much lighter soil, more sandy, and of gray to brown colors and from 1 to 3 inches in thickness, having a close yellow clay, more or less mixed with sand as subsoil. This subsoil also often holds, locally, beds of pebbles, and rests on sand and gravel, and in places on lime-rock, at varying depths. The bottom soils make from one-third to one-fifth of the area, and have a growth of oaks, poplar, beech, gum, iron-wood, etc. The soils are light, fine loams, often heavy, of gray brown to blackish colors, and from 3 to 8 inches in thickness. The subsoil, as a rule, is lighter than the surface soil, often containing pebbles, and is underlaid with sand and gravel.

Land is easily tilled in wet and dry seasons. The chief crops are cotton, corn, oats, and potatoes, the soil being well suited to all. Two-thirds of the tilled land is planted in cotton, which grows from 2 to 5 feet high—the higher the better for production. Early in the season, when fruitage is small and weather wet, cotton is inclined to run to weed. The average seed-cotton product per acre on fresh land is 450 pounds and on bottom lands 800 to 1,000, and it requires 1,660 pounds to a 475-pound bale. The cotton is usually graded as middling. After thirty years' continuous culture without manure the yield is from 300 to 400 pounds per acre. It only requires 1,545 pounds of seed-cotton from old land to make the 475-pound bale. After twenty years' rest for turned out land it will produce an average crop for 2 or 3 years. The soil on slopes is often much damaged by washings, and no efforts have been made to prevent the injury.

The cotton is shipped, either by river or railroad, to Montgomery, Selma, or Mobile. The rate from lower Autauga to Selma is $1, and to Mobile $1 50 per bale. From the upper part of the county the shipments are mostly to Montgomery.

ELMORE.

Population: 17,502.—White, 8,747; colored, 8,755.

Area: 630 square miles.—Woodland, all. Gravelly hills with long-leaf pine, 230 square miles; crystalline or metamorphic area, 400 square miles. Of the last-named area 175 square miles are also covered with the drift, making in all 405 square miles in which the drift soils prevail.

Tilled land: 73,897 acres.—Area planted in cotton, 31,045 acres; in corn, 20,000 acres; in oats, 5,153 acres; in wheat, 3,883 acres; in rye, 27 acres; in rice, 5 acres; in tobacco, 12 acres; in sugar-cane, 16 acres; in sweet potatoes, 642 acres.

Cotton production: 9,771 bales; average cotton product per acre, 0.31 bale, 441 pounds seed-cotton, or 147 pounds cotton lint.

Elmore county, like Lee, embraces the line of junction of the older crystalline rocks and the Cretaceous, but this line of contact is, as usual, hidden by the great accumulation of pebbles and sand of the post-Tertiary. None of the Cretaceous beds, so far as yet known, come to the surface, and the soils are made exclusively of the disintegrated metamorphic rocks or the overlying drift loams. The crystalline rocks form the county north of the latitude of Wetumpka, and in this area are the usual red and gray soils, elsewhere described as derived from the gneisses which constitute the greater part of the strata.

The gray lands predominate greatly in Elmore county, and are derived either from gneisses or from mica slates. Their fertility varies on this account between wide limits, as the mica slates, as a rule, yield soils of no great value, while some of the gneissic soils are of excellent quality. From 8 or 10 miles north of Wetumpka, southward, the stratified drift covers the country rocks everywhere, except where the drainage has cut through to the underlying beds.

The Coosa river above Wetumpka has rather narrow bottom lands, but beyond the bottoms, and of 2 or 3 miles width, is a tolerably level plain with sandy soil (occasionally mingled with pebbles), timbered with long-leaf pine. West of the river, in the latitude of Wetumpka, the country is an almost perfectly level plain to the Autauga county line, with an occasional slight elevation caused by an accumulation of pebbles. Upon this plain the soil is sandy and the subsoil rather stiff, so that the roads are always firm and hard, notwithstanding the sands. The timber is one unbroken forest of long-leaf pines, with very little shrubby undergrowth, but with a great variety of herbaceous plants, with showy flowers, especially in the moist depressions. Along the Tallapoosa, and in the fork of the Coosa and Tallapoosa rivers, there are tracts of first-class bottom lands, which have for many years yielded heavy crops of cotton.

The higher bottom lands above overflow and the second bottoms of the two rivers that form the southern and western boundaries of Elmore are perhaps the best cotton lands in the county, but some of the brown-loam table-lands and of the better quality of gneissic soils yield excellent crops. Shipments are made either by rail or by boat on the Coosa.

MONTGOMERY.

(See "Central prairie region".)

TALLAPOOSA.

(See "Metamorphic region".)

MACON.

(See "Central prairie region".)

LEE.

(See "Metamorphic region".)

RUSSELL.

(See "Central prairie region".)

THE CENTRAL PRAIRIE REGION.

This division comprises the whole or part of the following counties: Pickens,* Sumter, Greene, Hale, Marengo, Perry, Dallas, Wilcox,* Butler,* Lowndes, Autauga,* Montgomery, Crenshaw,* Pike,* Bullock, Macon, Russell, and Barbour.

PICKENS.

(See "Gravelly pine-hills region".)

SUMTER.

Population: 28,728.—White, 6,451; colored, 22,277.

Area: 1,000 square miles.—Woodland, all except a few isolated patches of open prairie, the extent of which cannot be given with accuracy, but is about 35 to 40 square miles; central prairie region, 575 square miles; post-oak flatwoods, 175 square miles; oak and hickory uplands with long-leaf pine, 250 square miles.

Tilled land: 172,100 acres.—Area planted in cotton, 80,662 acres; in corn, 51,402 acres; in oats, 2,706 acres; in wheat, 24 acres; in rye, 162 acres; in sugar-cane, 42 acres; in tobacco, 13 acres; in sweet potatoes, 1,056 acres.

Cotton production: 22,211 bales; average cotton product per acre, 0.28 bale, 399 pounds seed-cotton, or 133 pounds cotton lint.

A line running northwest and southeast through Livingston would mark approximately the limit of the prairies which form the upper part of Sumter county down to that line. This part of the county has an average elevation of about 150 feet above tide, and is underlaid throughout with the rotten limestone of the Cretaceous formation. This material is directly concerned in the formation of a considerable proportion of the soils, which are in some cases little more than the disintegrated limestone mixed with organic matter. Where this rock forms the surface the country is gently undulating, and the differences in level are very slight. Interspersed, however, throughout this whole canebrake region are ridges and hills capped with sand and pebbles of the stratified drift formation. These ridges are occasionally elevated 150 feet and more above the surrounding country and 250 feet above the river. Their distribution, structure, and other circumstances point to the conclusion that they are the remnants of a once universal covering of drift. Where this formation is at the surface the soils are sandy loams of the usual drift type. These loams, in mingling with the disintegrated limestone, give rise to a class of soils known as post-oak or prairie soils. As will be seen in the abstract of Dr. Webb's report, there are all gradations between the sandy loams and the black prairie soils. The open or bald prairie spots form only a small percentage of the whole area formed by the Cretaceous limestone (less than one-tenth).

Southwest of the line above alluded to, and occupying a belt varying in width from 5 to 8 miles, are the so-called flatwoods or post-oak flatwoods. This division shares with the prairies their gently undulating surface and elevation above tide. It rests, however, upon a bluish, tenacious clay of the lowest Tertiary formation. Like the prairies, this belt is covered in spots with the sands and other material of the drift, and the varieties of soils thus produced by intermixture are quite numerous. Beyond the flatwoods, in the southwestern part of the county, the sandy and clayey strata of the lignitic group of the Tertiary are, as a rule, hidden from view by the overlying beds of sand and pebbles and red loam of a later formation. This portion of the county presents the usual characters of the drift regions so often previously described. The high, level table-lands which occupy the main water-sheds have a sandy-loam soil and red-loam subsoil resting upon sand and pebbles, and these in turn overlie the laminated clays and other beds of the lignitic group. Sometimes the surface is made up of deep beds of sand, as is the case near Gaston. The growth upon these sandy tracts consists mostly of long-leaf pine and black-jack oak. Beds of lignite are exposed in many places throughout this section, and one of these, in a cut along the Alabama Great Southern railroad, has been on fire for many years. As yet this lignite has not been profitably used as a fuel.

The agricultural relations of Sumter county are similar to the adjoining counties of Mississippi and Alabama, which are situated in the same belt, which is pre-eminently the cotton belt of the state. While the soils of this belt are, perhaps, in the elements of plant-food, not much superior to those of other divisions, they are rendered more thrifty by the usually notably large percentage of lime.

ABSTRACT OF THE REPORT OF DR. R. D. WEBB, OF LIVINGSTON.

(This report refers to the bottom lands of Sucarnotchie river, a tributary of the Tombigbee, and to the prairies and uplands drained by the same.)

The three soils described are: the prairies or black lands, the upland and alluvial (creek bottom) sandy soils, and lastly the post-oak flatwoods.

The basis of the first is the Cretaceous limestone, that of the last a dense, firm, blackish-blue clay, and that of the sandy uplands the drift or orange sand overlying the two former. The region about Livingston is a spotted one, having, in addition to the three primary soils above mentioned, quite a variety of mixed soils, such as sandy flatwoods, prairie flatwoods, sandy prairie, prairie loam, etc. There is very little bottom land on the Tombigbee in this section.

The black prairie soil forms two-thirds of the lands in township 19, ranges 1, 2, 3, and 4 west, and extends northwestward to Mississippi, and in the other direction, through Marengo, Greene, Hale, Perry, Dallas, and Montgomery, to Macon county. The timber is a mixture of post, red, and white oaks, hickory, ash, walnut, and cedar. The soil is black, putty-like prairie, with no subsoil properly speaking, as the soil rests directly upon the underlying limestone, from which it has been derived. Its thickness is quite variable (from 3 to 5 feet, sometimes 10 to 12). This soil is easily tilled when dry, but difficult when wet.

The sandy uplands make up one-sixth of the region in question, and are widely distributed. The prevailing timber is chestnut, black-jack, red, and white oaks, hickory, black and sweet gums, long-leaf pine, and occasionally poplar. The soil is a sandy loam of brown to yellowish colors, with an average thickness of 1 foot to the subsoil, which is a red-clay loam, containing occasionally rounded pebbles of quartz.

The post-oak flatwoods form one-sixth of the region described, and extend northwestward to Mississippi and southeastward nearly to the Alabama river, in upper Wilcox county. The natural growth is post oak, pine, and hickory. The soil is usually a putty-like clay of a brown color, often 10 to 15 feet thick and without a distinct subsoil, and is underlaid below the depth of 10 or 15 feet with a stiff black clay impervious to water. From its nature this soil is difficult of cultivation, late, cold, and badly drained.

Of these soils the prairies are about equally well adapted to corn and cotton, the open prairies perhaps being best for corn. The other two soils are best suited to cotton, and this is almost the only crop on the flatwoods. On the prairies the stalk attains the height of 3 to 7 feet, being most productive at 5 feet. On the other soils the best height is about 3 feet. In wet seasons the cotton sometimes runs to weed, and the only remedy used (and this very seldom) is topping in August. The seed-cotton product on the fresh lands (prairies) is from 1,200 to 1,500 pounds; on the uplands and in the flatwoods, 600 to 1,000 pounds, about 1,660 pounds being needed in each case for a 475-pound bale. The staple rates from low middling to middling. After twenty-five or thirty years' cultivation (without manure) the yield is brought down to 300 or 400 pounds, with about the same proportion of seed to lint, and with very little difference in the quality of the staple, which, if anything, is not quite so good, but a little shorter. The most troublesome weeds are crab-grass, purslane, careless-weed, and coffee-weed. One-third of the uplands formerly in cultivation now lie turned out. Of the other lands very little has been abandoned, and of the flatwoods more is in cultivation now than ever before. In all cases where again taken into cultivation the land produces well. In the prairies and uplands there is some injury from washings, and the valleys suffer to a slight extent; in the flatwoods, on account of their level nature, there is no injury from this cause. Hillside ditching has been practiced to a limited degree, and with good success where properly done.

Shipments of cotton are made, as soon as it is ready, by steamer and by rail, to Meridian and Mobile. The freight rates to Meridian are $1, and to Mobile $1 25 per bale.

GREENE.

Population: 21,931.—White, 3,765; colored, 18,166.

Area: 520 square miles.—Woodland, all except a few small patches of open prairie, aggregating perhaps 25 square miles; prairie region, 395 square miles; pebbly hills, with long-leaf pine, 125 square miles.

Tilled land: 119,426 acres.—Area planted in cotton, 63,643 acres; in corn, 31,826 acres; in oats, 2,163 acres; in wheat, 314 acres; in rye, 25 acres; in sugar-cane, 25 acres; in tobacco, 41 acres; in sweet potatoes, 705 acres.

Cotton production: 15,811 bales; average cotton product per acre, 0.25 bale, 357 pounds seed-cotton, or 119 pounds cotton lint.

Greene county occupies a position with reference to the geological formations similar to that of Perry and Hale. In the northern part is the belt of drift of which mention has frequently been made, and in the southern the prairie region underlaid with the rotten limestone. The Warrior river makes its eastern and the Tombigbee its western boundary. The highest land in the county is situated in the northeastern part, within the drift area, where the main water-sheds are probably some 350 or 400 feet above the river-level. The average elevation of the prairies may be given at about 170 feet above tide, and the line between the drift belt and the prairies runs northwest and southeast through or near Eutaw, the county-seat. Northeast of this line the country is broken and hilly; southwest only gently undulating, with here and there a ridge or hill capped with the sands of the drift, the relics of a covering which once probably was spread over the whole prairie region.

The bottom lands of the Warrior river as far as Eutaw are about 1 mile in width, and are good farming lands, but are liable to overflow. From this bottom land there is a rise of 75 or 80 feet to a terrace or plain (second bottom or hummock), often 5 or 6 miles wide, with brown-loam soil and red clayey-loam subsoil, and from this there is an ascent to the table-lands, sometimes rather abrupt, but more often in several offsets. The soil and subsoil of the table-lands do not differ very materially from those of the terrace below, except that the lower plain is often more sandy than the table-land. Below the red loam, which forms the subsoil of both, are beds of sand and pebbles. The hills which border the table-lands have this red loam often at the surface, and the underlying pebbles also are frequently exposed by the removal of the loam. Red clay and gravelly hills are numerous and characteristic throughout the whole length of this drift belt.

The prairie region in Greene county has the features which have been described somewhat in detail under Hale and Sumter counties. In the lower part of this county, in what is known as the "fork", the lands are very much like those about Livingston, on the other side of the Tombigbee, and consist of calcareous or prairie lands, alternating with sandy ridges, sometimes capped with pebbles. This part of the county has always been celebrated, especially in *ante-bellum* days, for its fine cotton plantations.

In its agricultural features Greene county shows two widely different divisions: the upper, with its brown-loam soils, and the lower, with prairie or calcareous soils, the greater part of the cotton being produced upon the calcareous or prairie lands. No report has been received concerning the prairie lands of Greene county, but that on similar lands in Hale county will apply equally well here.

ABSTRACT OF THE REPORT OF THOMAS J. PATTON, OF KNOXVILLE.

(This report refers to the country drained by Sims' and Buck creeks, tributaries of the Warrior river.)

Three principal soil varieties are named, viz: sandy, rolling uplands; sandy, loamy bottoms of Sims' and Buck creeks, and the dark sandy loam of the Warrior river bottom. Of these the sandy uplands are most important, making at least three-fourths of the country about Knoxville. The timber consists of pine, oaks, hickory, ash, and gums. The soil is a fine sandy loam, dark on the surface and lighter colored underneath. The subsoil is generally a red clay, a little sandy, and almost impervious to water, underlaid with sand and pebbles, and occasionally a thin stratum of sand-rock at varying depths. The bottom soils above mentioned are not particularly described, as there is but little difference between the uplands and the bottoms, except that the latter are somewhat more level and more productive, especially for corn.

The land is easily tilled in wet and dry seasons. The chief crops are cotton, corn, oats, and potatoes, but the soil seems best adapted to cotton and potatoes. More land is planted in cotton than in all other crops combined. The average height of growth of cotton is 3 feet, and stimulating manure promotes fruiting more than growth. The seed-cotton product per acre on fresh land is 700 pounds, and 1,545 pounds are requisite for a 475-pound bale. This cotton rates as middling. The product per acre is reduced one-half by twenty years' culture without manure. From such worn lands it takes 1,600 pounds to the bale, and the staple is graded low middling. Crab-grass is very troublesome on this soil. About one-fourth of the land is turned out, but it is soon covered with a dense growth of pines, and if allowed to rest, say 20 years, it produces well. The hillsides, if neglected, are much injured by washings, but the washings of the top soil from the slopes is a benefit to the valleys.

Shipments of cotton are made chiefly in January and February by steamer to Mobile. The usual rate of freight to that port is $1 50 per bale.

HALE.

Population: 26,553.—White, 4,903; colored, 21,650.

Area: 670 square miles.—Woodland, all except a few tracts of open prairie; prairie region, 345 square miles; gravelly hills with pine, 325 square miles.

Tilled land: 140,072 acres.—Area planted in cotton, 69,995 acres; in corn, 43,254 acres; in oats, 3,671 acres; in wheat, 1,437 acres; in rye, 56 acres; in rice, 16 acres; in tobacco, 16 acres; in sweet potatoes, 1,214 acres.

Cotton production: 18,093 bales; average cotton product per acre, 0.26 bale, 372 pounds seed-cotton, or 124 pounds cotton lint.

Hale county, in its topography, geology, and other natural features, bears a strong resemblance to its neighbor Perry on one side, and to Greene on the other. Its upper half, nearly to the latitude of Greensboro', the county-seat, is formed of rolling uplands, which are so characteristic of the drift belt frequently alluded to. The lower half, on the contrary, is chiefly prairie land, very slightly undulating, and very little elevated, as a rule, above the water-courses. In the uplands the red loam, which overlies to a depth of 15 or 20 feet the sands and pebbles of the drift, forms all the most important soils and subsoils.

The table-lands, and the better class of uplands generally, have a brown-loam soil with red clay subsoil. This brown loam passes, on the one hand, into a light sandy soil, with long-leaf pine as the prevailing growth, and on the other into a stiff reddish soil with a considerable percentage of clay. The rocks which may underlie this drift deposit are hidden from view north of Greensboro'. In the vicinity of Havana, in the upper part of the county, the pebble and other materials of the drift are, in places, cemented together by hydrated oxide of iron into a rock of considerable hardness. At Havana this rock forms cliffs along the sides of a deep ravine, and fragments of it, often as large as a good-sized cabin, have been broken off and have rolled down the glen. Under the overhanging rocks on the sides of the ravine are growing some of the rare ferns of the state. (*a*)

The bottom lands of the Warrior river in Hale county are similar to those described at some length under Tuscaloosa county, and are generally well suited to corn, but less so to cotton. The average width of these bottom lands on both sides of the river is about 1 mile. Above the bottom lands is a level plain or terrace from 75 to 100 feet above the bottom proper, and in places some 5 miles wide. The soil upon this terrace or second bottom is a sandy loam, which is extensively cultivated, and which produces excellent crops, especially of cotton. From this terrace there is a gradual or abrupt ascent to the table-lands, which have a brown-loam soil and a red-clay loam subsoil, and vary from 300 to 400 feet above the river-level. Beneath the red-loam subsoil are beds of sand and gravel, often of great thickness. In ascending the hills bordering the table-lands these pebbles are passed over along most of the roads a short distance (15 or 20 feet) below the summits. The red-clay subsoil is found also beneath the soil of the lower terrace above spoken of, and this also overlies beds of pebbles and sand, as is the case with the table-lands. This appears to show that the face of the country had already suffered denudation prior to the deposition of the upper portion at least of the drifted materials, and that the more important of the river valleys had already been marked out. The soils of this terrace are, as a rule, rather more sandy than those of the higher table-lands, though otherwise the two have many points of resemblance.

The prairie lands of the southern part of the county are of the usual character, and are well described in the abstract of Mr. Harris' report given on page 121.

Some of the best of the canebrake lands of the state are situated in Hale county, and the uplands and river lands of the northern part of the county are among the best of their class.

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a Among others are *Camptosorus rhizophyllus*, Link; *Trichomanes radicans*, Swartz; and *Asplenium ebenoides*, Swartz. The last-named exceedingly rare fern was discovered in this locality by Miss Julia Tutwiler, the only other known locality in the United States being the banks of the Schuylkill river.

ABSTRACT OF THE REPORTS OF PROFESSOR HENRY TUTWILER, OF GREENE SPRINGS, AND NORFLEET HARRIS, OF LANEVILLE.

(These reports refer to the table-lands and bottom lands along Five-Mile creek, in the upper part of the county, and to the prairie and other lands lying adjacent to Big Prairie and Dry creeks, in the southern part. Professor Tutwiler's report describes the upland soils, which are chiefly sandy and red-clay soils, the former being best adapted to cotton, the latter to corn. Reference is made also to the dark sandy soil of Five-Mile creek and the Warrior river. The report of Mr. Harris describes the most important soils of the canebrake region. These are the first and second bottom lands of Big Prairie and Dry creeks, and low slough lands, and, in addition, the rolling-prairie lands of black and brown colors.)

The most important are the sandy and the red-clay soils, which make two-thirds of the land about Havana, the first a light-colored sandy loam, the latter a rather heavy clay loam of a brown to red color. The natural growth upon these consists of oaks, hickory, gum, short-leaf pine, poplar, etc. The subsoil is a red-clay loam, which, on cultivation, becomes like the surface soil. This rests upon beds of sand and gravel, and in certain localities upon the conglomorate above alluded to. Tillage is rather difficult in wet seasons, and the red soil also is difficult of tillage in dry weather, as it is disposed to crack. They are both naturally well drained.

The red lands are somewhat difficult to till in dry seasons, the chief crops being cotton, corn, oats, and potatoes. The sandy land is best suited to cotton; the red land to corn. About one-half of the land is planted in cotton, and the average height of growth is 3 to 4 feet. Too much rain in July causes cotton to run to weed; but this may be largely prevented by topping and shallow plowing. The seed-cotton product per acre on fresh land is from 800 to 900 pounds, and it requires 1,545 pounds of seed-cotton to a 475-pound bale. After ten years' continuous culture without manure the yield per acre is 400 pounds, and it takes 1,660 pounds of this cotton to the bale. Crab-grass, rag-weed, and bramble are nuisances to the farmer. Nearly all the turned-out land has been reclaimed within the last few years, and yields well for a short time. The hillsides are injured, but the valleys are generally benefited by washings.

A wet May is very injurious, as the land cannot be worked and the crab-grass gets the start of the farmers. Even more disastrous is excess of rain in July and August, when the cotton is fruiting most. When these months are hot and dry, immense crops of cotton are always made.

The three chief varieties of soil are as follows:

Rolling prairie lands of black or brown colors, which make about 50 per cent. of the area about Faunsdale. This soil, intermixed with those described below, make up the canebrake country for many miles in each direction. The prevailing timber consists of the various species of oaks, ash, hickory, sweet and sour gums, etc. The soil is a dark calcareous clayey loam 15 to 18 inches in thickness, resting upon a subsoil of a grayish or neutral-tinted clay, putty-like, but apparently quite fertile, since, when thrown up out of ditches, it produces a fine crop the first year. This clay is almost impervious, containing no pebbles or concretions, and is underlaid with a blue lime rock at 20 feet depth (rotten limestone). In wet weather cultivation is difficult, but in dry weather easy, and grass and weeds are then easily killed. This soil may be classed as early and warm when well-drained.

The next soil in importance is that of the rolling prairie lands of yellowish or red colors, commonly called post-oak prairies. These make up perhaps 35 per cent. of the country about Faunsdale, and have about the same distribution as the black prairies before mentioned. The timber is much the same as that upon the other land, with the exception that the post oak is the most characteristic tree. The soil is a clay loam, stiff and somewhat putty-like when wet, of buff, yellow, brown, and mahogany colors, and more particularly chocolate-colored in places. Its thickness is from 18 to 20 inches before change of color to that of the subsoil, which is heavier than the surface soil, being a stiff grayish clay, yellowish in places, and almost impervious. This subsoil contains no pebbles or concretions, and is underlaid with a blue lime rock, like the black soils (rotten limestone), at a depth of 20 feet. In wet weather this soil is difficult to cultivate, as it is very sticky; in dry seasons, however, it crumbles easily, and is readily tilled, being early and warm and usually well-drained, as the surface is quite rolling.

Lastly, a loose walnut prairie land makes up a small proportion of the country about Faunsdale. The growth is nearly the same as that upon the other lands described, with some cedar and black walnut in addition. This soil is a fine, loose silt or prairie of whitish to gray color, often 3 feet in thickness, with a subsoil of a white, heavy, putty-like clay, almost impervious to water. It contains occasionally a few rounded pebbles, and is underlaid, like the others, with the rotten limestone. These lands are somewhat difficult to cultivate in wet seasons, but are the easiest of all in dry weather, and are the best corn lands. The soil is late, and is not so well drained as the others. All these soils are planted in corn, cotton, oats, etc., the first two being best suited to cotton, the latter to corn. The post-oak land is perhaps the best for cotton, and, where a farmer has several varieties of soil on his place, two-thirds of the post-oak land is put in cotton. Two-thirds of the open ground of the black prairies also are put in cotton, but very little of the walnut lands is ever so planted. From 3½ to 4 feet is the most productive height of stalk. In wet seasons there is a tendency to run to weed, which is restrained by topping, or, as some prefer, by plowing close, so as to cut the side roots.

The average yield of seed-cotton on the fresh land is 1,200 pounds, from 1,485 to 1,660 pounds being needed for a 475-pound bale, the staple rating as good middling. Thirty to thirty-five years' cultivation without manure will bring down the yield to 800 or 900 pounds, and with very little difference either in the quality of the staple or in the proportion of lint to seed. Most of the land in the canebrake country has long been under cultivation, and the average yield is as above given. The post-oak land is thought to respond best to fertilizers. Crab-grass and morning-glories are the most troublesome weeds on the black lands, crab-grass and pepper-weed on the post-oak lands, and cockleburs, morning-glories, and water-grass on the walnut lands. At present all of the cleared land is in cultivation; formerly a large proportion (10 per cent.) was turned out. When reclaimed it takes usually about two years to conquer the weeds and grass, and the lands do not, therefore, produce as well the first year, but after that, for several years, the yield is nearly as great as on fresh land. All these lands, where at all rolling, wash badly on the slopes, and the damage from this cause would be very serious but for the fact that this is prevented at once by hillside ditching, and in a few instances by horizontalizing also. The valleys are not injured, but, on the contrary, are much improved by the washings from the higher levels.

Shipments of cotton are made from October to January (chiefly in November and December) to Mobile and Selma, both by rail and by steamer. The freight charges to Mobile by boat are from $1 25 to $1 75 per bale; by railroad the charge is higher—from $1 75 to $2 25. These charges vary also with the locality.

MARENGO.

Population: 30,890.—White, 7,277; colored, 23,613.

Area: 960 square miles.—Woodland, all except a few square miles of open prairie; prairie region, 480 square miles; oak and hickory uplands with long-leaf pine, 380 square miles; post-oak flatwoods, 100 square miles.

Tilled land: 169,097 acres.—Area planted in cotton, 80,790 acres; in corn, 43,876 acres; in oats, 6,574 acres; in sugar-cane, 43 acres; in tobacco, 43 acres; in rice, 26 acres; in sweet potatoes, 1,138 acres.

Cotton production: 23,481 bales; average cotton product per acre, 0.29 bale, 414 pounds seed-cotton, or 138 pounds cotton lint.

The northern half of Marengo county is formed by the rocks of the Cretaceous formation, and the southern by those of the Tertiary, giving thus a considerable variety of geological features, while the soils overlying and more or less modified by these different formations exhibit corresponding varieties.

The Cretaceous formation is represented by the beds of the rotten-limestone group, and the physical features and soils peculiar to this group are sufficiently characteristic. The surface configuration of this territory is nearly level, or at most gently undulating, especially where the rotten limestone forms or is very near the surface, broken by irregularly distributed ridges, capped by the sands and pebbles of the stratified drift. The soils vary from the stiff calcareous clayey or prairie soils of the rotten limestone proper through all gradations to the light sandy loams of the superficial beds. Where the rotten limestone itself forms the soil, it is a heavy clay soil, usually of a dark tint, with a subsoil of a yellowish-green color, and likewise of heavy nature. The color of the soil varies from gray to black, according to the amount of vegetable matter present. Where the rock itself is sufficiently near the surface the soil is usually destitute of trees, and constitutes the bald prairies, which are irregularly scattered throughout the territory.

A second variety of soil is known as the post-oak soil. This is a heavy sandy clay of reddish or yellowish colors, usually timbered with a prevailing growth of post oaks and short-leaf pine. Analyses of these several varieties of soil are given under the regional description. The sandy ridges previously mentioned are found throughout this region, but are more abundant and continuous for greater distances near the southern border of the limestone area. The town of Dayton is situated upon such a ridge, and as it is approached from the north the surface becomes more broken, and the black or dark-colored heavy prairie soils of the rotten limestone give way to a reddish, somewhat sandy soil, with a growth of post oaks and short-leaf pines, beyond a narrow strip of which come the sandy soils of the ridge proper.

Between Dayton and Linden is a belt of hilly land, in which a sticky, yellowish clayey soil (hill prairie) is quite common, and which has a characteristic growth of short-leaf pine, hickory, and red and post oaks. The underlying rock, wherever seen in this strip between Dayton and Linden, is a hard yellowish limestone containing Cretaceous fossils. The whole aspect of the country, its soils, timber, etc., resembles the Chunnenugga ridge at Union Springs.

South of the latitude of Linden, and extending east and west across the county, is a belt 5 or 6 miles wide of a low, gently undulating country called flatwoods or post-oak flatwoods. These flatwoods rest upon a heavy grayish clay filled with reddish spots, which in wet weather becomes so tough and intractable that the roads through it are almost impassable. By reason of their unfavorable physical composition these lands are comparatively little cleared and cultivated, though the analysis of a specimen of the clay from near Linden, given on page 52, will show that it is by no means deficient in the elements of a good soil, except in the proportion of lime, which is small. Southward still of this, to the Clarke county-line, the lower beds of the Tertiary formation, consisting of dark-colored clays and sands (with which are interstratified beds of lignite and of shell marl containing greensand), underlie the superficial beds of sand and loam which in general constitute the soil and subsoil throughout this entire section. The lignite beds are occasionally of exceptional thickness, one on Landrum's creek being between 6 and 7 feet. Of great importance agriculturally are the beds of shell marl spoken of. One of these is exposed at the bluff of Nanafalia landing, and makes its appearance at the surface at several points eastward, where its intermixture with the surface loam has given rise to a kind of prairie or limy soil of great fertility. Beaver creek flows along the foot of the hills running parallel with these marl outcrops, and hence the very superior quality of the lowlands which border it.

Between the Beaver creek lands and the post-oak flatwoods rise some of the highest hills of the county, the Rembert hills, with an elevation of 350 feet or more above the river-level. These hills are covered with the red-clay loam and have a fine oak growth. Where the Linden road crosses them there stand the handsome residences of the planters, who cultivate the river lands which they overlook.

In Marengo county and the northern part of Choctaw the river lands are usually from one-half to three-quarters of a mile wide, of river front or high land, with a fertile sandy-loam soil, all in cultivation and occupied by some fine plantations. In the bends there is often a much greater width of this front-land, and at the Turner place, above Tuscahoma, it is 2 or 3 miles. Back of this high land is the swamp, 1 to 3 miles wide, heavily timbered with sweet gum, holly, swamp chestnut, oak, elm, scaly-bark hickory, and white oak. The swamp is entirely uncultivated and traversed with sloughs, and the roads across it, even in dry weather, are far from good, and in the winter are almost impassable. This seems to be the general nature of the river lands throughout the region in which the lowest Tertiary or lignitic strata make the country.

The brown-loam uplands of the southern half of the county south of the flatwoods are in all respects similar to those of other parts of the state, and require no special mention.

Agriculturally, Marengo is similar to the adjacent parts of Dallas, Perry, Hale, Sumter, and Greene counties, in the prairie region, and Wilcox and others, in the oak and hickory uplands. The report of Rev. Mr. Stickney gives all the needed details concerning cotton culture in the principal cotton producing part of the county, viz, the canebrake.

ABSTRACT OF THE REPORT OF REV. W. A. STICKNEY, OF FAUNSDALE.

(The uplands described are the rolling and flat lands, with partly a loose black-prairie soil, partly a mulatto or post-oak soil, and partly a light ashy-colored cedar-glade soil, all lying within the drainage area of Cottonwood and Powell's creeks.)

The bottoms are late, and hence the young plant is ravaged in its very prime by the caterpillar, and these pests have not for years permitted the climate to discriminate between the uplands and the bottoms. This region is known as the canebrake. The creeks are only drains or artificial canals, perfectly dry in summer, except in holes. The higher lands yield better in wet years; the flat or bottoms best in dry years. The three kinds of soil most prevalent are: First, the loose black-prairie soils, level and rolling, much of it lying on the larger drains and their tributary ditches, and in the main protected from injurious overflow; second, the mulatto or post-oak stiff soil, mostly upland; and third, light-gray cedar hummock soil, also upland. Of these the most important is the black-prairie soil, which, however, constitutes less than half the lands of the region under discussion; but all these soil varieties are so intimately associated with each other that in a few feet square all may be seen. Occasionally a large unbroken body of the prairie soil will be met with. The principal trees

are the various oaks, scaly bark, ash, hackberry, cedar, sweet gum, red, white, and slippery elm, walnut, hickory, poplar, cottonwood, papaw, buckeye, persimmon, dogwood, cane, and dwarf palmetto. The physical characters of the soils of course change with the soil variety, and these are the loose, limy prairie soils, the stiff, sticky clayey soils, etc., of mulatto, yellow, blackish, and black colors, alternating or mixed. The average thickness may be from 5 or 6 feet to as many inches, the white, rotten limestone very commonly outcropping on the uplands. The subsoil is the same as the soil, the cistern lime-rock underlying all the canebrake soil. In exceptional spots the soil contains white rounded pebbles of quartz. The tillage is not difficult if the soil is stirred at short and opportune intervals by the plow. When well-drained the soil is early; when ill-drained the bottoms are unproductive.

The chief crops in the canebrake are cotton and corn, and the soil seems to be about equally well adapted to each; if any difference, it is in favor of corn. Two-thirds of the cultivated area is, however, in cotton. The stalk varies in height from 2 to 4 or 5 feet, the latter height being best if the plant is not molested by the worm. When well worked and when overtaken by a rainy season the plant is inclined to run to weed, for which no remedy is known. Dirt thrown too high upon the stem (*a*) is regarded as an obstacle to bolling and very injurious when the dirt is hot. In favorable seasons the fresh land will produce from 1,200 to 1,600 pounds of seed-cotton to the acre (barring the caterpillar). The average for a 475-pound bale is 1,600 pounds. The staple is of the best quality.

As to the yield after long cultivation it is difficult to speak with precision. In one of the favorable years some of our land, worked consecutively for 40 to 50 years without manure, will yield from 1,200 to 1,600 pounds per acre, while the thin uplands will hardly turn out 300 to 400 pounds of seed-cotton. The staple from old land is usually thought to be shorter than that from the fresh land. The most troublesome weeds are the morning-glory, crab and other grasses, and hog-weeds. Chicken corn is now overrunning us from bad culture. From 10 to 20 per cent. of the uplands have been turned out in some places, and the amount is greatly on the increase. When these lands are again taken into cultivation they produce well if they have been fertilized in the meanwhile by common pea-vines or clover; otherwise, poorly. The soil washes badly on slopes, and the injury is very serious and constantly on the increase because of negligence. Where the ditches are kept cleaned out the damage to the valleys is very slight. Since the war very little has been done toward checking this evil. Before the war the system of horizontalizing was very perfect, but the art is fast being lost.

In the northern part of the county the cotton is shipped as fast as baled to the nearest station on the Alabama Central railroad, and is there sold to the cotton buyers. This is from August to December. In the lower part of the county (from which, however, no definite reports have been received) the shipments are probably to Mobile by means of boats on the Alabama and Tombigbee rivers.

PERRY.

Population: 30,741.—White, 7,150; colored, 23,591.

Area: 790 square miles.—Woodland, all. Gravelly hills, with long-leaf pine, 465 square miles; prairie region, 325 square miles.

Tilled land: 167,666 acres.—Area planted in cotton, 74,303 acres; in corn, 48,132 acres; in oats, 6,093 acres; in wheat, 440 acres; in rye, 70 acres; in rice, 27 acres; in tobacco, 24 acres; in sugar-cane, 20 acres; in sweet potatoes, 1,107 acres.

Cotton production: 21,627 bales; average cotton product per acre, 0.29 bale, 414 pounds seed-cotton, or 138 pounds cotton lint.

A belt composed of thick beds of sand and pebbles covers all the northern part of Perry county as far south as the line connecting Greensboro' and Marion. Within this area the natural features are those characteristic of the stratified drift everywhere. The face of the country is somewhat broken, though there are no great elevations, the main water-sheds being about 300 or 400 feet above the level of the Cahaba river, which receives directly or indirectly all the drainage of the county. Upon the highest land it is usual to find the soil somewhat sandy and supporting a growth chiefly of long-leaf pine. Along the slopes, and at lower levels generally, a brown-loam soil is very widely distributed, and the timber upon it consists of the various species of upland oaks, hickory, and short-leaf pine, with occasionally the long-leaf species. Beneath this brown loam there is a rather stiff red loam, usually called red clay, which is underlaid with pebbles and sand at varying depths. A not uncommon thickness for the red clay or loam is 20 or 25 feet. This part of the county, while not enjoying the reputation of the lower part, has still some excellent farming lands. The level table-lands, which have an average elevation of 200 or 250 feet above the water-courses, are nearly all cleared, and have been long in cultivation. In some cases, from neglect or careless cultivation, they are badly worn or turned out, but when reclaimed and properly treated they are among the most desirable lands in the county. Wherever the drift forms the surface there is no lack of the best of drinking water to be had from wells and springs. Marion, the county-seat, and a great educational center, stands on the southern limit of this drift belt, overlooking the prairies, which stretch away for 20 miles toward the south in a gently undulating, trough-like plain, lying between the drift hills on the north and similar ones on the south.

The rotten limestone formation of the Cretaceous forms the substratum throughout the prairie or canebrake country, and the topography and soils show very little variation. The prairie soil proper is a stiff, putty-like soil, originally gray, but usually of dark to black color (from organic matter). This soil can scarcely be said to have a subsoil, since it rests directly upon the rotten limestone, from which it is derived. The thickness varies greatly, the bare rock being exposed in many places without any soil at all, and in the sloughs and low places there is often several feet thickness of alluvial or made soil. The uniform level of the prairies is interrupted at intervals by low hills or knolls, which are capped with the sands and other beds of the drift. In many cases it appears that these elevations owe their existence to the protection afforded by these materials. Where the sands and loam of the drift are mingled with the calcareous soils of the prairies there is formed what is universally known as the post-oak prairie soil, which is a yellowish to reddish material of considerable fertility, characterized by the prevalence of the post oak among its timber trees. These are sometimes also distinguished as "woods prairies". Upon the sandy ridges and knolls of this section are situated many of the towns and settlements of the county, the abundance of good water and freedom from mud being the strong attractions.

The belt of prairie country underlaid with the rotten limestone has been given as about 18 or 20 miles wide. In the extreme southern corner of the county a bed of rather hard crystalline limestone is found resting

a This high dirting in the midst of the plant's fruiting will commonly stimulate it to extra growth, but check fecundity for the time being, as if the two growths were too much at the same time. I have heard of breaking the roots by siding with a long colter plow, as a means of cutting off the excessive supply of sap, thus restraining weedy growth and favoring fruiting.

upon the rotten limestone, and as it is tolerably resistant to denudation the region of its occurrence is somewhat more broken and rugged than that where the rotten limestone is the surface rock. In the eastern part of the state this hilly region is known as the Chunnenugga ridge. The soil, where the overlying drift sands are in great thickness, is sandy and of no great fertility, but where on the slopes these materials have been partially removed by erosion the influence of the limestone is felt, and the soil becomes a calcareous loam of considerable fertility, approaching in character the soils of the post-oak prairies, which, indeed, are formed in a very similar manner. In the neighborhood of Marion, which is upon the extreme southern limit of the upper drift belt, the bluish micaceous clayey rocks of the lowest division of the Cretaceous formation may be seen in the deepest cuts and gullies, but they have very little influence upon the soils or topography, since they are covered with thick beds of the drift, and are not seen at all, even in the deepest cuts, much north of Marion.

Agriculturally this county shows two distinct characters: brown-loam uplands in the northern half, and prairie in the southern. Notwithstanding the greater inherent fertility of the latter region, the brown-loam lands are probably of more importance in the production of cotton.

ABSTRACT OF THE REPORT OF H. A. STOLLENWERCK, OF UNIONTOWN.

(The soils described are the black slough lands, the black and yellow post-oak lands, and the uplands.)

The uplands soils are considered the most important, and are distributed over the canebrake country in patches, making more than half of the tillable lands. These uplands occupy the slight elevations of the prairies, and the soils grade almost imperceptibly into those of the prairies. Intermediate between the two are the post-oak soils. The upland soil proper is a sandy loam, with subsoil of yellow clay. The color varies from light gray, through brown, to almost black, and the underlying rock is the rotten limestone, which is everywhere found at depths varying from 1 to 20 feet.

The chief crops produced are cotton and corn, the black or slough lands being best suited to corn, and the uplands to cotton. About two-thirds of the tilled land is in cotton, which attains the average height, when most productive, of 4 feet. The plant inclines to go to weed in wet weather, and no effectual remedy is known. The seed-cotton product of the fresh land is from 1,200 to 1,800 pounds, and 1,485 pounds are needed to make a 475-pound bale, which rates as middling. After ten years' cultivation without manure the yield is from 800 to 1,000 pounds, with no difference observable either in the proportion of lint to seed or in the quality of the staple if it is properly gathered and ginned. The most troublesome weed is the morning-glory. About one-fourth of the land originally in cultivation now lies turned out, and, as it is rolling, the soil washes away, and the reclaimed land is, on this account, not very productive. The valleys also are often injured to the extent of 10 per cent. by the washings from the uplands. Some efforts have been made, by horizontalizing and hillside ditching, to check the evil, and with very good success.

Shipments of the cotton crop are made between the months of October and January, usually by rail to Selma. The rate of freight is $1 75 per bale from Uniontown.

DALLAS.

Population: 48,433.—White, 8,425; colored, 40,008.

Area: 980 square miles.—Woodland, all except a few square miles of open prairie; prairie region, 830 square miles (rotten limestone or canebrake, 700, hill prairies, 130); gravelly hills, with pine, 150 square miles.

Tilled land: 207,404 acres.—Area planted in cotton, 115,631 acres; in corn, 46,542 acres; in oats, 8,260 acres; in wheat, 71 acres; in tobacco, 13 acres; in sugar-cane, 18 acres; in sweet potatoes, 2,256 acres.

Cotton production: 33,534 bales; average cotton product per acre, 0.29 bale, 414 pounds seed-cotton, or 138 pounds cotton lint.

Dallas county is traversed by the Alabama river, which flows through it from northeast to southwest. Its principal tributary, the Cahaba river, flowing southward, falls into it at the old town of Cahaba. The bottom lands of the Alabama river are sandy fertile loams, which are especially suited to the cultivation of corn. A second bottom, or terrace, often 5 or 6 miles wide, sometimes altogether on one side of the river, sometimes equally divided by the river, adjoins the true bottom lands. This terrace is generally sandy, and is almost a level plain. The soils are gray or light-colored, and are well suited to cotton. This terrace has an average elevation above the river of about 100 feet. From this out to the summits of the various dividing ridges there is a rise more or less gradual to the elevation of 350 or 400 feet, which may be taken as the average elevation of the table-lands above the river.

The geological structure, upon which depend the character and distribution of the soils, is simple. The underlying rocks are the strata of the Cretaceous formation, consisting, in the middle and northern part of the county, of an impure limestone, known as the rotten limestone, and in the southern of a yellowish, often crystalline limestone, and a bluish sandy marl. Over all these have been deposited beds of varying thickness of sand, pebbles, and loam of the stratified drift formation. From all these beds and their intermixtures the surface soils of Dallas county have been derived. In the northern part of the county, above Summerfield, the underlying rocks are completely hidden from view by the surface beds of drift, and the loams of this formation furnish the soils and subsoils, which have the usual variety common in such localities. The best of these soils is a brown loam, with red-clay loam subsoil, resting on sand or gravel. Its timber is a mixture of the upland oaks and hickory. With admixtures of sand the soil changes in character, and the timber with it, long-leaf pine being added to the growth and black-jack oak becoming prevalent. The extreme in this direction is seen in the upland pine woods, which occupy many of the pebbly and sandy slopes of the northern portion of the county. Several analyses, representing these soil varieties, have been given of soils collected in the neighboring county of Autauga (see page 39).

Going southward from Summerfield this brown-loam region, which is also universally known as the hilly country, extends to within 2 miles of Selma, where the river terrace is reached. As already stated, this terrace has a superficial covering of sand resting upon the rotten limestone, which is exposed wherever the streams have cut their channels a few feet below the general level. Within 2 miles of Selma, in the drainage area of Little creek, the black prairie soil is crossed nearly up to the city limits, and near the river the sands form the surface. From Selma to Cahaba is the same sandy river plain, the monotony of which is only broken in the vicinity of the streams.

Westward from Orrville to the limits of the county, and also northwestward, is a prairie or canebrake country of the usual character: a gently undulating region with no great elevations, having the rotten limestone at or very near the surface, yielding calcareous soils of gray to black colors, affording splendid hard roads in dry seasons, but almost impassable muds in the winter. Here and there throughout the prairie region are slight elevations

capped with sandy loams (sometimes associated with pebbles) of the drift formation, apparently the remnants of a once universal covering of these materials. The mingling of these loams with the calcareous soils gives rise to the formation of red sandy prairie soils, upon which the post oak seems to be most at home. On the eastern side of the river the same characters are to be seen out to the Lowndes county-line. The sandy ridges, which traverse the prairies, appear to be quite as characteristic of this region as are the prairie soils themselves. Orrville is upon one of these sandy belts. Many of the details concerning these soils and their composition are in the description of Perry and Marengo counties and in Part I, where several analyses of typical prairie soils have been presented (see page 47).

The yellowish, often crystalline limestone mentioned as underlying the lower part of the county is, like the rotten limestone, covered with the beds of the drift formation. These are, however, much more universally present here than in the central part of the county, where, as has just been said, they simply cap the ridges which traverse the prairies. The existence of hard ledges of limestone, alternating with softer strata, greatly influences the topography of this part of Dallas county. The table-lands, or high level country, at an average elevation of 350 or 400 feet above the river, have the brown-loam soils and red clayey loam subsoils of the best uplands resting on beds of sand and pebbles. The thickness of these beds may be put at 25 or 30 feet in the lower part of the county. Toward the streams these table-lands break off, usually quite abruptly, by reason of the hard limestone ledges alluded to, giving rise to the steep lime-hills of this section. The soils derived from these calcareous rocks are mostly yellowish calcareous loams, which at a certain stage of moisture form the most tenacious of muds.

The bottom soils of the creeks of this section are sandy and more or less affected by the lime of the neighboring hills, and as a consequence make fine farming lands. Of this character are the bottom lands of Cedar, Dry Cedar, and Mush creeks. In these bottoms, however, there are all gradations between black, limy, and loose sandy soils, according to locality. The villages of Carlowville and Pleasant Hill are situated upon plateaus with brown-loam soils, timbered with the usual variety of upland oaks. A descent of 25 or 30 feet from the level of these plateaus brings one to the calcareous rocks which underlie this part of the county. The lowlands along Dry Cedar and Mush creeks are from 2 to 3 miles wide, and are generally cleared and in cultivation, except where occasionally worn land has been turned out. Pebbles, often of large size, are commonly found along the slopes of the plateaus above alluded to.

Dallas produces more cotton than any other county of the state. To this its large area (980 square miles) contributes in an important degree, but its large proportion of rich prairie or canebrake and Alabama river lands would place Dallas county in the first rank in cotton production.

ABSTRACT OF THE REPORT OF J. F. CALHOUN, OF MINTER STATION.

(This report refers to the lands lying between Pine Barren and Dry Cedar creeks on the north and south, and between the lines separating ranges 10 and 11 and the Alabama river.)

The soils in cultivation in cotton are: 1, sandy uplands; 2, rolling or hilly prairie; and 3, creek bottoms.

The most important of these soils is that of the uplands, which makes at least one-half of the region described. The timber consists of species of oak, except pin oak, chestnut, hickory, gum, short-leaf pine, and chinkapin. The top soil is usually a fine sandy loam of a gray color 6 inches thick, resting upon a subsoil of coarse red clay, which sometimes, though rarely, contains rounded pebbles of quartz. Beds of sand and gravel underlie the subsoil at the average depth of 10 feet. This soil is easily tilled, except in very dry seasons.

The rolling-prairie soil makes about one-eighth of the region described, not occurring in continuous tracts, but cropping out at different places. The timber is mostly post-oak, hickory, and black-jack. The top soil is a somewhat heavy shell prairie of a gray color, 8 inches thick, with a rather heavier subsoil of lighter color than the top soil, very hard and waxy. The subsoil contains shells and the fragments of the lime-rock which forms the general substratum of the section at varying depths. In wet seasons the tillage is difficult, and the lands are rather late and cold.

The creek bottoms, which border the two large creeks mentioned, and also the numerous smaller tributaries of the same, make about three-eighths of the lands of the section. Their natural timber growth consists of white and pin oaks, beech, hickory, ash, etc. The top soil is a coarse, sandy, often gravelly loam, sometimes a heavy clay loam; colors, gray to brown; subsoil, usually a white, stiff, crawfishy clay. White pebbles of quartz are not uncommonly found. The subsoil rests mostly upon sands, which is difficult to till in wet seasons. These lands are late, cold, and usually ill-drained.

The rolling prairies are best suited to grain crops, very little cotton being planted; the other two to cotton, which makes about three-fourths of the cultivated crops upon them. The height of stalk varies from 2½ to 3 feet, but is most productive at 3 feet. In wet seasons there is sometimes a tendency to run to weed, for which as a remedy the application of phosphates is suggested. The seed-cotton product per acre of the fresh land is 800 pounds, of which about 1,545 pounds are needed to make a 475-pound bale. The staple is rated as low middling. After thirty to forty years' cultivation without manure the yield falls off to less than one-half, and the staple becomes shorter and lighter. The rolling prairies, after a few years' cultivation, are injured badly by washes, and soon rust the cotton. The most troublesome weeds are hog-weed, cocklebur, morning-glory, and a species of purslane, which spreads close to the ground and seems to sap the moisture. Very little of the uplands is turned out, because the use of fertilizers has brought it into demand. The land seems to be very slightly benefited by lying out. A large proportion of the hilly prairies is abandoned, because thoroughly worn out and washed away. The subsoil is not usually washed off. The bottom lands are nearly all in cultivation, and are improved by resting, unless soured by lack of drainage. The uplands and rolling prairies are injured by washings, but the valleys adjoining are improved. Horizontalizing and hillside ditching are practiced with success in the uplands; in the hill-prairie region they are very little practiced, because of the very broken character of the country.

Shipments of the cotton crop are made mostly during September and October, by rail to Selma, from the lower part of the county, at $1 10 per bale. From other sections the other railroads and the Alabama river furnish the means of transportation. Selma is the great cotton market, not only of this county, but of neighboring counties in the canebrake region.

WILCOX.

(See "Oak and hickory uplands, with long-leaf pine".)

BUTLER.

(See "Oak and hickory uplands, with long-leaf pine".)

LOWNDES.

Population: 31,176.—White, 5,645; colored, 25,531.

Area: 740 square miles.—Woodland, all except a few square miles of open prairie. Prairie region, 740 square miles (470 rotten limestone and 270 rolling or hill prairies). In the prairie region a large area of the uplands are brown sandy loams.

Tilled land: 181,272 acres.—Area planted in cotton, 98,200 acres; in corn, 41,169 acres; in oats, 3,630 acres; in sugar-cane, 201 acres; in sweet potatoes, 1,004 acres.

Cotton production: 29,356 bales; average cotton product per acre, 0.30 bale, 429 pounds seed-cotton, or 143 pounds cotton lint.

In general, the agricultural features of Lowndes county are similar to those of Montgomery, which adjoins it on the east. The underlying country rocks are beds of the Cretaceous formation, and these are in places partly or wholly covered with the later beds of sand, gravel, clay, and loam of stratified drift. Most of township 16, in the limits of this county, lies within the river plain, and is made up chiefly of the first- and second-bottom lands. These have a general elevation of 30 or 40 feet above low-water mark, and are approximately level. The soils are mostly sandy, but very productive, especially in the first bottoms, and being subject to overflow, are usually planted in corn, of which crop 40 bushels to the acre are often made. These bottom lands, while prevalently sandy, still show the beneficial effects of the calcareous substratum. In many places there is a slight slope away from the immediate bank of the river, the foot of the first terrace being often as much as 10 or 15 feet lower than the actual river bank.

About the line between townships 15 and 16 there is a tolerably abrupt rise of 175 or 180 feet to a level, which between Lowndesborough and Manack's station is from 1 to 2 miles wide. This terrace has the drift and loam as surface materials, but the calcareous beds of the Cretaceous formation crop out in many places along the hillsides, separating the river hummock from the first terrace, and producing limy soils. Pebble beds also occur along this slope, but very few are seen as low as the hummock proper, except upon the summits and the sides of the little knolls, which rise above the general level of the river hummock. The soil of the first terrace above spoken of is a sandy loam of brown to gray colors with a subsoil of red-clay loam, and is in all respects similar to the soils and subsoils of the drift belt in other parts of the state.

From this first terrace there is a second rise of about 75 feet to the level of the Lowndesborough plateau, which has about the same elevation as the table-lands of Autauga county (some 250 or 260 feet above the river). Between Lowndesborough and Hayneville this plateau is five or more miles in width, and has all the characters of the table-lands of this latitude. The soil is a brown loam of considerable fertility, with a red-clay loam subsoil, which is in many places underlaid with beds of pebbles. The analysis given on page 39 of the table-lands soil of Autauga county will show fairly the general characters of this class of soils. The level nature of the land and the abundance of good water to be had everywhere in the sands and pebbles combine to make this and other plateaus of similar kind among the most desirable as farming lands and as places of residence.

Near the line between townships 14 and 15 there is a descent, going southward, of some 120 feet (usually in at least two terraces) to the general level of the prairies. Thence to about the line between townships 12 and 13 the black prairies continue with very little variation, and with approximately the same general level. South of this line the strata of the Upper Cretaceous formation, consisting of ledges of hard limestone, alternating with softer and more clayey beds, make the country down to the line of Butler county. Throughout this region the surface is much broken, the country being a succession of steep and sometimes rocky hills, with clayey, calcareous soils. In wet weather the soil becomes a very tenacious mud, which, together with the steep slopes of the hills, makes the country almost impassable for vehicles. The southwestern corner of the county, which is of this character, has the name of "Little Texas".

In a general way, this hilly country makes the water-shed between the north and south flowing streams, the former being tributaries of Manack's and Big Swamp creeks, the latter of Sepulga river and Cedar creek. One of the tributaries of the last-named stream, viz, Dry Cedar creek, drains this hilly country toward the north. The bottom lands of most of these streams are excellent farming tracts, but are in general best suited to corn.

The principal soil varieties have already been mentioned in passing. These are the sandy loam soils of the table-lands, the dark loam soils of the bottoms, and the calcareous soils of the prairies and lime-hills, and will be described more in detail in the following abstract.

Although the whole of Lowndes county lies within the prairie belt, yet there is a fair proportion of upland soils, which are derived from the transported beds of the drift. The agricultural characters of the county are thus quite varied, but are quite similar to those of the corresponding regions in other counties adjoining.

ABSTRACT OF THE REPORTS OF W. M. GARRETT, OF MOUNT WILLING, AND P. T. GRAVES, OF BURKVILLE.

(The lands described are within the drainage area of Pintlala and Cedar creeks.)

The upland soils vary from black prairie on the north to sandy loams on the south. In dry seasons the uplands are not so sure of a good crop as are the lowlands, but with moderately wet weather the former are far more productive. The red table-lands have a clay loam soil of a brown to reddish color, 10 to 18 inches in thickness, with a subsoil of red clay or loam, in the main free from pebbles and sand, and resting at a depth of 10 to 18 feet upon a bed of gravel and sand. The soil is usually easily tilled, warm, and well drained. The black prairie lands have a black or dark-colored soil of 8 to 10 inches thickness, passing gradually into the light-colored limestone, and have the usual characters of the prairie soils. The bottom soils are of several kinds, according to the surrounding uplands, and need no particular description.

The principal crops are cotton and corn, the latter being most productive on black lands, the former on sandy lands; but the red lands produce both crops equally well. From two-thirds to three-fourths of the tillable land is devoted to cotton. Cotton generally grows from 3 to 5 feet high, but in wet seasons it runs to weed, which can only be prevented by shallow culture and the free use of manure. Fresh land produces from 1,000 to 1,200 pounds of seed-cotton per acre, and a 475-pound bale requires from 1,485 to 1,660 pounds of seed-cotton. This cotton classes as low middling. Ten years' culture reduces the yield to 900 pounds, and fifty years' culture reduces it from 200 to 500 pounds, provided no fertilizers are used. Crab-grass is the greatest pest to cotton. Very little land is turned out; but when it is level it is easily restored to its former productiveness. The hillsides are somewhat injured by washings; the valleys are also sometimes injured, if the deposit is deep and composed chiefly of sand.

Two railroads, the Selma and Montgomery and the Montgomery and Mobile, traverse Lowndes county, and its northern boundary is made by the Alabama river. There are thus ample facilities for the transportation of crops to the markets. Cotton is usually sent by railroad, as fast as prepared for market, to Montgomery or Selma, at rates varying from 50 cents to $1 25 per bale, according to locality.

AUTAUGA.

(See "Gravelly hills region".)

MONTGOMERY.

Population: 52,356.—White, 13,457; colored, 38,899.

Area: 740 square miles.—Woodland, all except a few square miles of open prairie; 565 square miles of level and hilly prairies, of which 75 square miles has a coating of drift; 100 square miles of sandy and pebbly hills with pine.

Tilled land: 241,570 acres.—Area cultivated in cotton, 112,125 acres; in corn, 62,303 acres; in oats, 4,895 acres; in wheat, 58 acres; in sugar-cane, 174 acres; in sweet potatoes, 1,720 acres.

Cotton production: 31,732 bales; average cotton product per acre, 0.28 bale, 399 pounds seed-cotton, or 133 pounds cotton lint.

The Tallapoosa and Alabama rivers, where they form the northern boundary of Montgomery county, mark very nearly the line between the rotten limestone and the underlying Lower Cretaceous beds. These rivers, especially the Alabama, have wide hummocks or second bottoms above overflow and bottom lands of great fertility. The second bottom, or old river plain, is from 2 to 4 or 5 miles wide, and in some places, as between Benton and Montgomery, is very level, and where not too much covered with the alluvial sands is a fine farming region. Beyond the river plain is a ridge of sand, pebbles, and clay of the stratified drift, which gradually slopes away to the level or gently undulating prairie lands of rotten limestone, which form a belt across the middle of the county. In this belt the materials of the stratified drift are, in places, wholly wanting or in places present in limited quantity, where they are seen capping the small hills of the otherwise level prairies. Southward, beyond the black or canebrake belt, we encounter another accumulation of these drift materials overlying the sandy marls of the Ripley or Chunnenugga group of the Cretaceous formation.

The sands and laminated clays of the lowest division of the Cretaceous formation, while often exposed on the river bluffs, do not come to the surface in Montgomery county, and therefore take no part in the formation of its soils. The next overlying series, however, the rotten limestone, is here, as elsewhere, of great importance agriculturally, as being the basis of the prairie lands, which are among the most valuable in the county. The drift, however, with its red and yellow loams resting upon beds of sand and gravel, forms all the fine upland soils, which are interspersed with the prairie soils, and which prevail in the southern part of the county.

The greater part of the cotton, and indeed of all the crops, is made in the prairie belt and along the first and second bottoms of the river, and of the numerous streams flowing into it. These bottom lands are of great variety, some being stiff prairie soils, others light and sandy, and this applies as well to the bottom lands of the river itself, where the greatest variety may be seen. The abstract given below will show in detail the nature and characteristics of these various soils. In its agricultural features Montgomery very closely resembles Lowndes. The cotton, as soon as ginned, is hauled to the city of Montgomery, and there sold.

ABSTRACT OF THE REPORTS OF THOMAS W. OLIVER, OF MONTGOMERY, AND J. A. CALLOWAY, OF SNOWDOUN.

(The region reported upon lies, as to the lowlands, along the small streams tributary to the Tallapoosa river and along the waters of Ramer and Catoma creeks.)

The uplands are the rolling and level table-lands adjacent to these streams and the prairie lands, which occupy the lower levels in the same region. The lowlands are often overflowed, necessitating late planting of the cotton, which is thus liable to be destroyed by the caterpillar before it has had time to mature a crop. For this reason the uplands are generally preferred for cotton where the soil is at all suitable. The chief varieties of soil are the red lands, which are the upland loams, the post-oak and black-prairie soils, and the light-gray sandy soils lying between the red lands and the river bottom. This last occupies a narrow belt only. To these may be added the dark loam and the light sandy soils of the smaller streams above mentioned.

The most important of these soils is the prairie soil, which is found in patches over all the central portion of the county, and which is the main one of the black belt throughout the state. This soil occupies from a half to three-fourths of the area described, and has a natural growth consisting of post oak, hickory, hawthorn, wild plum, ash, etc. It has the usual heavy prairie soil of a gray to black color. The post oak or timbered prairie soil is often of a reddish color, and is thought to be the result of the admixture of the overlying loam with the calcareous matter of the Cretaceous rocks. On the black lands the subsoil is a jointed clay, white and chalky, overlying a blue marl. (*a*) The subsoil often contains lime nodules of irregular shape. When properly broken up, the soil, on exposure and drying, crumbles down and is very easily tilled, but in wet weather it is stiff and difficult to work.

The red-loam land is timbered with oaks, hickory, short-leaf pine, and the bottoms with poplar, gum, magnolia, etc. The soil is a sandy loam of different degrees of stiffness, and of colors varying from brown to red, according to the length of time cultivated. At 8 or 10 inches the color changes to that of the subsoil, which is generally a fine red loam, about one-third sand, friable when exposed, and darkening when mixed with vegetable matter. It contains occasionally rounded pebbles of quartz, and is underlaid with beds of sand and gravel, which, of course, rest at varying depths upon the country rock.

The sandy land, which occupies a narrow strip between the red lands and the river bottoms, has a growth of short-leaf pine and oaks, with water oak and sweet gum in the flats. The soil is a light loam, mostly sandy, of white, gray, and yellowish colors, and 4 to 6 inches deep to a change of color. The subsoil is nearly the same as the soil; if anything, more of a yellowish clay, with an admixture of coarse sand. Pebbles are found in the subsoil on slopes and elsewhere in places.

All these varieties are generally easily tilled in dry weather; but in wet weather the prairies especially are often quite difficult. The chief crops are cotton, corn, and oats, the sandy lands being suited to cotton and the prairie lands to corn and oats. From two-thirds to

a These terms allude to the varying aspect of the rotten limestone as it is disintegrated under the influence of the weather, the blue marl being the unaltered rock, and the joint clay, of chalky appearance, the same rotten limestone, broken and partially desiccated.—E. A. S.

three-fourths of the tillable land of all sorts is devoted to cotton, which is most productive when 3 or 4 feet high. In wet seasons, on fresh land, the cotton is inclined to run to weed. This may be prevented by an application of phosphates, to promote early fruitage. The seed-cotton product per acre on fresh land is from 1,000 to 1,200 pounds and 400 pounds on the sandy soil, and it requires from 1,600 to 1,660 pounds to produce a 475-pound bale. After forty to fifty years' cultivation without manure the average yield is about 500 pounds per acre; 200 pounds on sandy land. Burrs, morning-glory, and crab-grass are most troublesome. Very little land is turned out. Serious damage is sometimes done to hillsides by washing.

The various railroads which center in the city of Montgomery and the Alabama river furnish the means of transportation for all the products of the county. The city of Montgomery has always been one of the best cotton markets of the state, and receives the crop from many sections.

CRENSHAW.

(See "Oak and hickory uplands, with long-leaf pine".)

PIKE.

(See "Oak and hickory uplands, with long-leaf pine".)

BULLOCK.

Population: 29,066.—White, 6,944; colored, 22,122.

Area: 660 square miles.—Woodland, all except a few square miles of open prairie; prairie region, 300 square miles (200 of black prairie, etc., and 100 of hill prairie or Chunnenugga ridge); oak and hickory uplands, with long-leaf pine, 360 square miles.

Tilled lands: 176,860 acres.—Area planted in cotton, 80,470 acres; in corn, 47,441 acres; in oats, 6,177 acres; in wheat, 111 acres; in rye, 88 acres; in sugar-cane, 429 acres; in rice, 16 acres; in sweet potatoes, 773 acres.

Cotton production: 22,578 bales; average cotton product per acre, 0.28 bale, 399 pounds seed-cotton, or 133 pounds cotton lint.

Bullock county lies wholly within the Cretaceous region, and both the upper and lower subdivisions of this formation are concerned in the formation of its soils. In addition to this, the beds of the stratified drift are spread over all, modifying the soils, and in some cases forming them outright. The limit between the upper and lower divisions of the Cretaceous, running nearly east and west, falls near the center of the county, the precise position of this limit being very difficult to determine, because of the overlying drift.

Of the two divisions of the Cretaceous represented in this county (rotten limestone and Ripley), the former is not found south of the ridge upon which Union Springs is situated (Chunnenugga ridge). Beyond this to the southern line of the county the Ripley marls and limestone make the country. This ridge, which divides the waters flowing into the Tallapoosa river from those of Cowikee creek and Conecuh and Pea rivers, slopes gently away toward the south, but toward the north there is a rather abrupt descent into the prairie lands, which stretch thence northward to the county-line. Of the prairies there is little to be said in a general way more than has already been given under other counties, and the very full reports below will furnish all the needed details.

Chunnenugga ridge has a northeast and southwest direction, and is made up of beds of limestone, marl, clay, and sand. (*a*) In the calcareous clays resulting from the disintegration and intermixtures of these beds small white concretions of lime are abundant, and perhaps characteristic.

From the statistics it will be seen that this county ranks high in cotton production, and the following abstracts of carefully prepared reports which relate to all parts of the county will be read with profit by all who desire to have an acquaintance with the capabilities of the several soil varieties. The farmers, as a rule, sell their cotton as fast as baled to the merchants at Union Springs, and thence it is shipped by rail to the various markets. The rates to Montgomery and Columbus, Georgia, are about $1 50 or $2 per bale.

On account of the great variety exhibited in the agricultural features of Bullock county, I have given somewhat in detail the reports of correspondents from the different sections; and since the adjoining counties are in many respects similar, a repetition will not be needed in each case.

The greater part of the cotton crop is produced upon the calcareous lands of the upper part of the county, where the effects of constant (natural) marling are seen. In the brown-loam uplands, and their intermixtures with the sandier materials, we have nothing different, from an agricultural standpoint, from what may be seen in so many parts of the state.

ABSTRACT OF THE REPORTS OF W. M. STAKELY AND J. F. CULVER, OF UNION SPRINGS.

(This report relates particularly to the black lime-lands, partly bald prairie and partly timbered, lying north of Chunnenugga ridge, near Union Springs.)

The black lands alternate with the post-oak prairies, presently to be described, in such a way as to make it impossible to give any strict limits between the two. Taken together, they occupy a belt from 5 to 10 miles wide across the country, widening toward the west. The growth on the black uplands, which make about a fifth of the arable lands of Bullock county, consists of post oaks, interspersed with hickory, short-leaf pines, and other trees in small numbers, and an undergrowth of haw bushes, and is indicative of good cotton land. The heavy soil is a clay loam, sticky, and prairie-like in places, and of gray to black colors, according to the amount of vegetable matter present; thickness to a change of color, from 3 to 12 inches. The subsoil is commonly heavier than the surface soil, and consists of tough yellow and tough reddish clays. The sandy soils have sometimes a yellow sand as subsoil. These subsoils frequently have limy concretions, and are underlaid with a blue marl (rotten limestone) at 10 to 12 feet depth. In wet seasons this soil is difficult to till, because of its sticky nature; but in dry weather, when previously prepared, it is easy of tillage, and in general may be classed as an early, warm soil.

Cotton, corn, and oats are the principal crops produced, the soil being best suited to the first two, though three-fourths of the cultivated land is in cotton, which grows to a height of from 2 to 5 feet, being most productive at about 4 feet. Very wet weather causes the plant to run to weed, which is restrained by thorough drainage. The seed-cotton product of the fresh land is 800 pounds (1,425 to 1,545 pounds

a The marl and limestone contain the fossils characteristic of the Ripley group, and have furnished many of the newly-described fossils of this horizon.

to the bale of 475 pounds). The staple is good middling. After twenty years' cultivation the yield is 500 pounds, with a slightly shorter staple and slightly less lint. Crab-grass and morning-glories are the most troublesome weeds. At present very little of this kind of land lies turned out, and when it is reclaimed it produces well the first year and better afterward. There is some slight damage from washings; but the valleys are not much injured by the washings from the uplands, and efforts made by hillside ditching to check it have met with moderate success.

ABSTRACT OF THE REPORT OF J. L. MOULTRIE, OF UNION SPRINGS.

(Relates more particularly to the post-oak lands or timbered prairie lying upon the headwaters of Cupiahatchee creek, a tributary of the Tallapoosa river.)

The prevailing growth is post oak, short-leaf pine, with some hickory, red oak, and black-jack on hills; in the bottoms, poplar, elm, gum, ash, shell-bark hickory, and some walnut. The light soils are fine loams; the heavier, more clayey; colors, gray red to nearly black. Thickness to change of color, 3 to 6 inches; in the bottoms, 1 to 2 feet. Subsoil mostly red-joint clay; sometimes a yellow marly clay. On sandy hummocks the clay is yellow and mixed with mica, and is underlaid with blue or greenish marl; on sandy hummocks, sometimes pebbles, about 13 feet from surface, and only about 6 inches deep. A blue marl underlies the subsoils at a depth of about 25 feet. In wet weather the soil is rather difficult to till, as it becomes sticky, and it is always heavier than the sandy land. The soil is naturally well drained, even in bottoms, and is early and warm. Cotton, corn, oats, and sweet potatoes are the chief crops. The thin gray and clay lands are best suited to cotton, the deep black land to corn and oats, and the white bald prairie to corn.

Fully three-fourths of the land is put in cotton. The stalk grows from 2 to 5 feet, being most productive at 4 feet. In wet seasons, and on moist and alluvial lands, the plant sometimes runs to weed. One of the remedies suggested is to plant every second or third row in corn or break the land very shallow. The average seed-cotton product per acre of fresh land is 800 pounds (1,545 pounds to a 475-pound bale), and the staple is middling. Twenty-five years' cultivation will reduce the yield to 500 pounds, with staple perhaps about an eighth of an inch shorter than that of the fresh land; the seeds are also less, which makes the proportion of lint and seed about the same. Crab-grass gives the most trouble, and morning-glories late in the summer in the black lands. Yellow-dock is troublesome if it ever gets a hold. None of this land lies turned out, except for want of labor to cultivate it, and from this cause probably one-twentieth is idle. If neglected, this soil is likely to be injured from gullies. The valleys are not hurt unless the washings are clay. Hillside ditching is sometimes practiced with good success.

ABSTRACT OF THE REPORT OF M. L. STINSON, OF UNION SPRINGS.

(Refers chiefly to the sandy and loamy soils making the bottoms and uplands upon the waters of Conecuh and Pea rivers and their tributaries.)

The soil varieties described are derived from the loams and other drifted materials of the post-Tertiary formation, and vary in accordance with the varying proportions of sand and clay. The varieties enumerated are: First, loam lands, with growth of short-leaf pine, oaks, and hickory; second, loam lands, with black-jack as the characteristic growth; and third, sandy lands, with prevailing timber of long-leaf pine and black-jack oak. The lower part of the county south of Union Springs is made up of these lands, the sandy pine lands occupying about half the territory, the other two varieties the balance. The oak uplands have, in addition to the growth above named, chestnut, beech, poplar, elm, magnolia, cottonwood, cucumber, dogwood, maple, walnut, etc. The soil varies from a fine sandy to a stiff prairie-like consistence where the marls of the Cretaceous are near enough to the surface to be felt; thickness to a change of color, 1 to 6 inches. The subsoil, from 6 to 18 inches, is a stiff yellow clay or dark yellowish sand, containing occasionally rounded pebbles of quartz. Below the subsoil, clay and sand to the marl, at an average depth of 30 feet. The black-jack land sustains a growth of pine, hickory, black-jack, and post oaks, some chestnut, chincapin, sloe, etc., and has a soil chiefly sandy, 2 inches deep, with subsoil of yellowish sand, containing pebbles, and from 2 to 8 feet deep. The underlying rock, at depths of 40 or 50 feet, is the marl above alluded to. The two soils seem to differ only in the depth from the surface of the clay and upon its quality.

The third variety of land supports a growth of long-leaf pine and black-jack oak, and needs no further description, as the same quality of land has been frequently the subject of remark, and the pine woods, wherever found, bear approximately the same character.

Agriculturally, the loamy and sandy lands are of easy tillage, and are all warm and well drained. The prairie lands are considerably earlier than any of the sandy lands, and cotton grows much more rapidly on the strong limy lands. The usual crops are produced upon all these lands, the stiffer clayey lands being best suited to cotton, and the sandy to corn and pease. About half the cultivated area of the first two and about a third of the pine land is in cotton. The height of stalk varies greatly, but the higher the better for yield. When the plant runs to weed, which it does sometimes when left too thick, more room is given. The maximum yield of seed-cotton on fresh land is from 1,000 to 1,300 pounds for first quality, 800 for the second, and 600 for the pine lands, and 1,545 pounds is about the average for a 475-pound bale. The staple rates from middling to strict middling. Ten years' cultivation will reduce the yield, on an average, 20 per cent., and on some of the lighter lands even more. The staple from worn land is somewhat shorter than that from fresh, and rates a grade less on the average. Crab-grass is the most troublesome of the weeds, except the Florida purslane (*Richardsonia*) in the piny woods. Not much of the originally cultivated land lies turned out, except for lack of labor to cultivate it. The pine land has not been cleared up much. The better qualities do very well when reclaimed, but the worn pine lands are not considered worth the trouble of reclaiming. The loam lands, because of their uneven surface, are liable to injury from washing; but the pine lands are mostly level. Hillside ditching is practiced with very good results.

MACON.

Population: 17,371.—White, 4,587; colored, 12,784.

Area: 630 square miles.—Woodland, all. Gravelly hills, with long-leaf pine, 330 square miles; prairie region, 260 square miles; metamorphic region, 40 square miles.

Tilled land: 133,924 acres.—Area planted in cotton, 56,763 acres; in corn, 23,833 acres; in oats, 6,195 acres; in wheat, 1,916 acres; in rye, 45 acres; in sugar-cane, 140 acres; in sweet potatoes, 928 acres.

Cotton production: 14,580 bales; average cotton product per acre, 0.26 bale, 372 pounds seed-cotton, or 124 pounds cotton lint.

The geological and agricultural features of Macon county are, in great measure, similar to those of its neighbor on the east, Russell. In the extreme northern part of Macon county the metamorphic or crystalline rocks make the substratum of the country. These are generally covered by the superficial deposits of a much more recent period, and seldom take any prominent part in the production of the soils. The line of contact of these rocks with those of the Cretaceous formation is everywhere hidden by these surface beds, and it is only south of Tuskegee that the Cretaceous strata have been recognized. The black Cretaceous prairie soil does not appear over any considerable area until the southern limit of the county is nearly reached, within 7 miles of Chunnennugga ridge (Tuomey).

The remarks of Professor Tuomey upon the soils of this part of the county are of sufficient value to be presented at this point again. In speaking of the area formed by the rotten limestone, he says: "The surface is undulating and covered with black and yellowish soils. The bald spots are covered with ash-colored soils. The whole of the limestone near the surface is broken up by laminæ and joints, but yet contains fossils in place and numerous concretionary nodules of lime so white as to resemble caustic lime. This stratum is about 20 feet in thickness; this is called by the well-borers 'clay', and is the limit of the sipe-wells. The water, percolating through the fissures, furnishes these wells. Under this the rotten limestone assumes its usual characteristics. Near Town creek a good opportunity was afforded of seeing the junction of the post oak and ordinary soil of the prairie." At this place Professor Tuomey observes: "1. The fissured rock mentioned above, which is found on all the bald spots. 2. The sudden termination of the preceding stratum as if it were washed away by water. 3. A bed without fossils, which appears to be an accumulation of lime and clay with organic matter, deposited after the removal of a portion of the fissured rock, the subsoil of the post-oak soil."

From these passages it seems that the post-oak soil is the result of the reaction of the limy materials of the Cretaceous beds upon the loams of the overlying and more recent formation, while the ordinary prairie soils are the result of the disintegration of the rotten limestone itself. The fact that soils in many respects analagous to the post-oak soils are to be seen where the calcareous rocks of the Tertiary have, after disintegration, mingled with the overlying loams gives additional force to the view advanced by Professor Tuomey.

A short distance east of the town of Tuskegee the beds of drift are well displayed. These consist of 20 or 25 feet of light-colored micaceous sands with cross bedding, above which are about 4 feet of reddish sand, and over this 10 feet of the white, all capped by the reddish, irregularly stratified beds of sand, clay, and loam of the usual type of the stratified drift. Of course, with such thickness, of overlying strata, the Cretaceous rocks rarely have much to do with the soils.

In the southeastern corner of the county the sandy ridge, with substratum of bluish marl, which is so prominent a feature of Bullock county, occupies a small area. Upon this ridge the soils are sandy and loamy, but beyond it come the peculiar soils of the Cowikee lands, already fully discussed under Russell and Barbour.

The creeks which traverse Macon county have in many instances cut their channels through the surface-covering of drift, and the soils along the lowlands thus formed frequently differ very considerably from those of the adjacent uplands. Caleebee creek, from its source to its mouth, passes through a rich country with dark soil, derived from the rotten limestone and other Cretaceous rocks. The same may be said of Cupiahatchee creek. The uplands on and near both the streams have mulatto soils with a growth of oaks and hickory. Eufaupee creek for 20 miles from its mouth flows through a country with yellow sandy soil and a stiff yellow clay below, containing usually a good deal of yellow and white quartz pebbles. Big Swamp creek traverses a rich section of the county. The soil is dark and very productive. Chewacla creek passes generally through piny woods, but cuts through the surface beds, and the bottom soils are in places dark blue and very productive. The pine land is poor.

Agriculturally, Macon county enjoys several advantages over its western neighbors on the pine-hills belt, for in the southern part of the county the underlying calcareous rocks are exposed, and in the eastern the same is true of the blue marl, as it is called. Both these underlying formations exercise a very beneficial influence upon the prevailing sandy loams, which are marled more or less thoroughly by such intermixtures.

ABSTRACT OF THE REPORT OF JOHN L. COLLINS, OF TUSKEGEE.

The soils are the varieties above enumerated. Those of the uplands are generally sandy loams, of yellowish to light colors; those of the bottom vary with the locality, being clay loams, and in places are prairie-like. The subsoils, mostly somewhat heavier than the top soils, often consist of yellow or red clay, and in most of the county are underlaid with sand, which often contains pebbles. The soils are easy of tillage, except when wet. The chief crops are cotton, corn, oats, rye, wheat, etc., and the lands are about equally well adapted to each.

Two-thirds of the cultivated land is in cotton, which on good land attains a height of 4 feet; on poor land, 18 inches to 2 feet. In wet seasons there is sometimes a tendency to run to weed, for which no remedy is suggested. When the land is fresh the seed-cotton product per acre is from 700 to 1,000 pounds, of which about 1,425 pounds go to make a standard bale of 475 pounds. The staple rates as low middling. After five years' cultivation, without manure, the yield is one-third less on the uplands. On the bottoms there is no perceptible change in either the quantity or quality of the yield. Crab-grass is much the most troublesome of the weeds. Perhaps a third of the land originally cultivated now lies turned out, but when again taken into cultivation it yields about a third less than when fresh. On slopes all this land washes badly, and the injury to the uplands is considerable, but the bottoms are, if anything, benefited thereby. Occasionally efforts have been made to check this by horizontalizing, etc., and with very fair success.

Shipments of the cotton crop are made chiefly in October and November, by rail, to Montgomery, at the rate of $1 30 per bale.

RUSSELL.

Population: 24,837.—White, 6,182; colored, 18,655.

Area: 670 square miles.—Woodland, all. Pebbly hills with pine and oak uplands with pine, 370 square miles; blue-marl lands, 300 square miles.

Tilled land: 134,320 acres.—Area planted in cotton, 81,582 acres; in corn, 34,335 acres; in oats, 9,789 acres; in wheat, 1,099 acres; in rice, 65 acres; in sugar-cane, 196 acres; in sweet potatoes, 1,093 acres.

Cotton production: 19,442 bales; average cotton product per acre, 0.24 bale, 342 pounds seed-cotton, or 114 pounds cotton lint.

Russell county, though underlaid with the strata of the Cretaceous formation, depends for its soils in great measure upon the thick beds of the stratified drift, which cover the whole county to a greater or less degree. The great drift bed which borders the older formations of the state crosses this county from east to west, and covers the northern half. The water-shed between the Tallapoosa and the Chattahoochee, which is the continuation of the Chunnenugga ridge of Bullock county, enters Russell near the middle of its western boundary. Its further course northeastward toward Columbus has not been definitely traced out, but it is probable that it is soon merged into the great pebble belt previously mentioned. Northward of this ridge occasional patches of the black prairies of the

rotten limestone are met with where the overlying pebbles and sands have been removed by denudation. The prairies, however, are in detached bodies, and do not form large tracts, as is the case to the westward.

Southward and southeastward of the water-shed previously mentioned the beds of marl, etc., of the Ripley group are often exposed by the removal of the drift deposits, and the reaction of this marl upon the overlying loams gives rise to the peculiar soils of Cowikee creek. Some of the characters of this class of soils have been given under the head of Bullock county, and vary from a stiff to a rather sandy clay, the lighter soils being found generally on the north side of the streams. Local patches of a tenacious clayey soil, called "hog-wallow prairie", are here and there met with in the Cowikee lands. The timber throughout this region is a mixture of long-leaf pine, with hickory, white and Spanish oaks, and sweet and sour gums and maple in the bottom lands. The hog-wallow clay in dry weather packs very much after the fashion of the prairie soil of the rotten limestone, but the colors differ, being reddish here, and grayish or grayish-yellow in the rotten limestone. The low, heavy lands of the Cowikee alternate with light sandy soils upon the hillsides and divides, and occasionally beds of deep white sand are encountered, which remind one of the pine barrens of the extreme south. The presence of an unusually large proportion of mica in the drift sands has been mentioned under Bullock county, and the same thing may be noticed in this county also.

A line drawn diagonally through the county from northeast to southwest would approximately separate the rotten-limestone lands from those of the Ripley marls. The former are found only in detached bodies among the greatly preponderating loams and sands of the overlying drift, while the latter are quite characteristic of the region in which they occur.

From what has been said, it will not be difficult to understand the variety and distribution of the soils as they occur in Russell county, being the sandy and loamy soils of the post-Tertiary deposits on the one hand, and the heavy black-prairie soils of the rotten limestone and the stiff, clayey to light sandy and marly soils of the Ripley group on the other. Most of these soil varieties have already been fully described.

The high rank of Russell county in cotton production is due chiefly to the cultivation of the lands in which the blue marl, as it is called, forms the substratum. The intermixture of the blue marl with the overlying loams has the effect of stimulating the latter to its utmost capacity.

The cotton crop is usually sold to the merchants at the various railroad stations in the county, and thence shipped to the various markets north and east.

BARBOUR.

Population: 33,979.—White, 13,091; colored, 20,888.

Area: 860 square miles.—Woodland, all. Oak and hickory uplands, with long-leaf pine, 610 square miles; blue-marl lands, 250 square miles.

Tilled land: 197,455 acres.—Area planted in cotton, 100,442 acres; in corn, 61,822 acres; in oats, 10,264 acres; in wheat, 131 acres; in rye, 112 acres; in rice, 35 acres; in tobacco, 22 acres; in sugar-cane, 647 acres; in sweet potatoes, 1,274 acres.

Cotton production: 26,063 bales; average cotton product per acre, 0.26 bale, 372 pounds seed-cotton, or 124 pounds cotton lint.

A line drawn east and west through Barbour county near the center will divide it into two parts, which are quite dissimilar. The soils on the north of this line are more or less calcareous, those on the south sandy. The northern half has a substratum of marl and limestone of the Upper Cretaceous formation (Ripley group), which, acting upon the soil, gives rise to some of the best and safest cotton lands in the state. This portion of the county is drained by the three forks of Cowikee creek, and is known throughout the county as the Cowikee lands. The soil is a moderately stiff calcareous clay, with patches of what is known as hog-wallow, which are seldom more than an acre or two in extent. In the immediate vicinity of the streams the soil is much more sandy, but highly productive. The general appearance of these lands is that of a gently undulating, occasionally hilly region, somewhat resembling the prairies of the rotten-limestone country, but with reddish or light-colored soils. This region, though fertile, is malarious, and is inhabited by comparatively few white families. The negroes, however, appear to endure it very well. There is a peculiar mixture of trees characterizing these lands, viz: hickory, white and Spanish oaks, sweet and sour gums, and long-leaf pine. The latter appears out of place with such surroundings.

Upon the divides in the Cowikee region the strata of the post-Tertiary are found, consisting of sands, clays, and pebbles, with the usual irregular stratification. These beds throughout the county show a larger proportion of mica than is usually seen; a fact which may possibly find an explanation in the nearness of the metamorphic area of the state. The soils produced by these surface beds are of the same general nature with similar soils in other parts of the state, varying from the extremes of sandy to clayey, and supporting a correspondingly varied growth—long-leaf pines upon the sandier and the various species of oaks upon the more loamy portions.

The southern half of the county is underlaid generally with the beds of the Tertiary formation, but these are seldom concerned in the formation of the soils, since they are covered with the sands and loams of the stratified drift. Upon occasions the Tertiary beds approach the surface and bring about modifications of the soil. Taken as a whole, however, the soils of the southern half of Barbour are deficient in lime and generally sandy, and the country high and rolling, and good freestone water is attainable by wells from 20 to 30 feet deep. This land is not specially suited to cotton, though the free use of fertilizers will always produce a satisfactory yield. In places where the overlying drifted materials have been partially removed the calcareous and greensand beds of the Tertiary give rise to the formation of local tracts of very fine soil, similar in all respects to those mentioned under Pike county.

The Chattahoochee river forms the eastern boundary of the county, and the bottom lands of this stream are from 1 to 3 miles wide, and very productive. Next to these are the second bottoms or hummocks, or pine flats, always safe and easy to cultivate. Bordering upon these are the foot-hills of the pine uplands.

Although the larger part of the surface of this county is occupied by brown loams, with a growth of oak, hickory, and pine; yet the characteristic agricultural features of Barbour depend upon the blue marls of the Cowikee and other drainage areas of the northern half of the county. A large proportion (more than half) of the cotton crop is produced in the northeastern part of the county, where these marls give character to the soils. There is

perhaps no part of the state which ranks higher in the production of cotton than the blue-marl lands of adjacent parts of Russell, Barbour, and Bullock counties, whose prevailing soils are light sandy loams, easily worked, possessing a comparatively high percentage of lime, by which they are rendered extraordinarily thrifty.

ABSTRACT OF THE REPORTS OF JUDGE H. D. CLAYTON, OF CLAYTON, AND DR. H. HAWKINS, OF HAWKINSVILLE.

(The region reported upon lies at the headwaters of Choctawhatchie river, and includes both uplands and lowlands; also, the Cowikee lands are described.)

No local causes influence the growth of cotton in the former region, but in the Cowikee lands the heavy dews are thought to be favorable to the growth. The upland soils are gray to red in color, and mostly sandy and porous. The gray lands are about three-fourths and the red about one-fourth of the area. The growth upon the gray land is a mixture of long-leaf pine, red, white, and post oaks, and hickory, and that on the red land the same, with the addition of walnut, persimmon, grape-vines, chincapin, buckeye, etc. The red soil is usually much stiffer than the gray, and has a subsoil of sometimes very hard clay and sand, underlaid frequently with a hard-pan at a depth of several feet.

These soils are of easy tillage at all times, and produce the usual crops, being, however, best adapted to grain, potatoes, and pease, although cotton forms at least half of the cultivated crops. The most productive height of stalk is about 3 feet. In wet seasons, and on fresh land, the plant sometimes runs to weed, but this may be checked by the free use of commercial fertilizers and by topping. The seed-cotton product of the fresh land is given at 1,000 pounds (one-third lint), this average yield of lint being estimated from the observation and experience of thirty years. The staple rates high in the market (exact grade not given). Cultivating 3 to 4 years without manure will bring down the yield to 500 pounds with a little shorter staple. Coffee-weeds are more troublesome than any other, but none will give trouble where the crop is properly worked. About a fourth of this kind of land lies turned out, chiefly because since the war the negro laborers cannot be induced to care for the land and keep the ditches cleared out either on hillsides or in the bottoms unless especially hired for the purpose, and this takes too much money from the owner of the land to justify him in so doing. On some farms, where the negroes have become attached to the place, they can by a little coaxing be induced to keep up the land.

When turned out for 10 or 15 years and grown up in old-field pine lands will produce nearly as well as the fresh lands when reclaimed. A great deal of injury is done both to the hills and the valleys by washings and gullies. When the hillsides are turned out and grow up in the pines, the valleys are improved, there being no washings from above.

The soil of the Cowikee lands is a fine sandy loam, alternating with a heavier, clayey, sometimes prairie-like loam, both more or less strong in lime. The color is usually gray or yellowish, and the subsoil is also of light color. The common growth is oak, hickory, and long-leaf pine. The three branches of Cowikee creek flow together before reaching the river. On the north side of each the land is comparatively level, and the principal growth pine; the soil, light-gray, chincapin, and hog-wallow. On these the cotton is small but very prolific, though most subject to rust after the land has been cultivated for a few years. On the south side of these streams the land is much stronger, with more lime, and produces a large cotton weed; it is also better for corn.

In wet seasons the land is rather difficult to till, but yields fine crops. Cotton occupies four-fifths of the cultivated land, and the height of stalk at which it is most prolific is from 3 to 4 feet. In wet weather the plant inclines to run to weed, but the application of commercial fertilizers will usually check this. The seed-cotton product of the fresh land is from 1,000 to 1,200 pounds, one-third lint, and the staple rates high in the markets. Six years' cultivation will bring down the yield to between 400 and 600 pounds. When properly cultivated, weeds give no trouble. About 10 per cent. of the land lies out, but it does well when reclaimed. The soil washes badly on slopes, and the valleys are injured, often to the extent of 10 per cent., by the washings from the uplands. Some slight efforts have been made to check the damage by horizontalizing, hillside ditching, etc., and with good success.

Shipments of the cotton crop are made throughout the season, usually by railroad, to the eastern markets. From Clayton the rate to Eufaula is $1 per bale; distance, 20 miles.

THE FLATWOODS BELT.

This comprises a narrow strip running through the counties of Sumter,* Marengo,* and Wilcox.*

SUMTER.

(See "Central prairie region".)

MARENGO.

(See "Central prairie region".)

WILCOX.

(See "Oak and hickory uplands, with long-leaf pine".)

OAK AND HICKORY UPLANDS, WITH LONG-LEAF PINE.

This region comprises wholly or in part the following counties: Sumter,* Choctaw, Clarke, Monroe, Wilcox, Butler, Conecuh, Covington,* Crenshaw, Montgomery,* Bullock,* Barbour,* Pike, Coffee, Dale, and Henry.

SUMTER.

(See "Central prairie region".)